Vol. 1004 Number 4

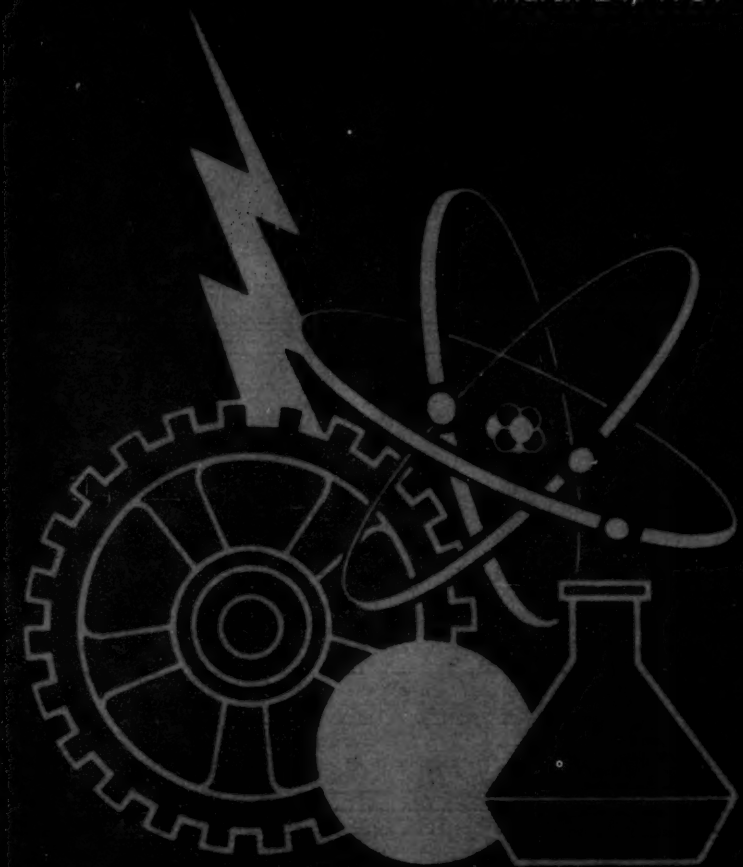
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 24, 1981



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

March 24, 1981 Volume 1004 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the list of PCT member countries and the most recent PCT rule changes see the notice appearing at 1001 O.G. 14 in the OFFICIAL GAZETTE of Dec. 9, 1980.

Note that the international fees have been increased as of Jan. 1, 1981. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	$300.00
International fees:	
Basic fee (first 30 pages)	$265.00
Basic supplemental fee (for each sheet over 30)	$ 5.00
Designation fee	$ 64.00

SIDNEY A. DIAMOND,
Jan. 13, 1981. *Commissioner of Patents and Trademarks.*

Late-Filed Renewal Fees

Sections 9 and 31 of the Lanham Act (15 U.S.C. §§ 1095 and 1113) require that an additional five dollar ($5.00) fee be submitted by a registrant who files a renewal application during the three-month period following expiration of its registration. The language of the statute requires that this additional fee be submitted within the three-month grace period. A number of registrants who have failed to submit the additional fee within the prescribed period have petitioned the Commissioner to allow their renewal applications. The Commissioner has granted petitions of this kind where the registrant or its attorney maintained a Patent and Trademark Office deposit account which contained, on the date the renewal application was filed, sufficient funds to cover the additional fee. Specifically, the Commissioner has exercised discretion under Trademark Rules 2.146(a)(3) and 2.147 to deem the authorizations to charge the deposit accounts to have taken place at the time the registrants filed their renewal applications, even though the authorizations were not confirmed until a later date. This Office policy was established by the Commissioner's decision in *In re Ralston Purina Co.*, 191 USPQ 154 (Comr. Pats. 1976).

The policy established by the *Ralston Purina* decision is being changed. Henceforth, the Commissioner will no longer exercise discretion to charge deposit accounts *nunc pro tunc* for trademark renewal application fees. To allow an authorization to charge a deposit account to relate back to a date on which no actual authorization existed is, in effect, to allow late payments. It is inequitable to permit those registrants who have deposit accounts (or those whose attorneys have such accounts) to make late payment of renewal fees, while those without deposit accounts may not.

Petitions relying on *Ralston Purina* will, after the date of this notice, be denied, unless the events that gave rise to those petitions occurred before publication of this notice.

MARGARET M. LAURENCE,
Feb. 20, 1981. *Assistant Commissioner for Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,984, Re. S.N. 204,472, Filed Nov. 6, 1980, Cl. 73/117.3, ENGINE IGNITION AND POWER ANALYZER, William Clayton, Jr., Owner of Record: *Clayton Manufacturing Company, El Monte, Calif.,* Attorney or Agent: Harold L. Jackson, et al., Ex. Gp.: 244

3,806,280, Re. S.N. 211,224, Filed Nov. 28, 1980, Cl. 417/222, FLUID DEVICE INTERCHANGEABLE DISPLACEMENT CONTROL MEANS, Wilfred S. Bobier, Owner of Record: *Inventor,* Attorney or Agent: Andrew R. Basile, et al., Ex. Gp.: 343

3,877,244, Re. S.N. 183,107, Filed Sep. 2, 1980, Cl. 62/314, MODULAR DRY-AIR EVAPORATIVE COOLER, Leonard J. DiPeri, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 344

3,945,350, Re. S.N. 168,520, Filed Sep. 18, 1980, Cl. 123/32 EA, FUEL INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES, Eric H. Ford, Owner of Record: *Lumentation Limited, London, England,* Attorney or Agent: Gerrit D. Foster, et al., Ex. Gp.: 342

3,981,282, Re. S.N. 168,624, Filed Sep. 18, 1980, Cl. 123/117 R, IGNITION SYSTEMS AND FUEL INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES, Eric H. Ford, Owner of Record: *Inventor,* Attorney or Agent: Gerrit D. Foster, et al., Ex. Gp.: 342

4,125,779, Re. S.N. 207,001, Filed Nov. 14, 1980, Cl. 340/630, SMOKE DETECTOR, William J. Malinowski, Owner of Record: *Chloride, Inc., Tampa, Fla.,* Attorney or Agent: Robert E. Ross, Ex. Gp.: 234

4,127,028, Re. S.N. 209,352, Filed Nov. 21, 1980, Cl. 73/194 B, CORIOLIS MASS FLOW RATE METERING MEANS, Bruce M. Cox., et al., Owner of Record: *Halliburton Company, Duncan, Okla.,* Attorney or Agent: John H. Tregoning, et al., Ex. Gp.: 244

4,132,398, Re. S.N. 209,133, Filed Nov. 21, 1980, Cl. 271/9, APPARATUS FOR REMOVING SHEETS FROM STACKS, Otto Erdmann, et al., Owner of Record: *Hauni-Werke Korger & Co., KG., Bergedorf, Germany,* Attorney or Agent: Peter K. Kontler, et al., Ex. Gp.: 313

4,139,076, Re. S.N. 212,986, Filed Dec. 4, 1980, Cl. 181/151, LOUDSPEAKER ENCLOSURE WITH ENHANCED BASS RESPONSE, John O. Hruby, Jr., Owner of Record: *Inventor,* Attorney or Agent: C. Russell Hale, et al., Ex. Gp.: 211

4,194,379, Re. S.N. 212,107, Filed Dec. 2, 1980, Cl. 70/421, PICK-PROOF LOCK, Harry E. Dice, Sr., Owner of Record: *50% to George K. C. Hardesty, Mayo, Md.,* Attorney or Agent: Terrell C. Birch, et al., Ex. Gp.: 355

PATENT NOTICES

Certificates of Correction for the Week of Mar. 24, 1981

Re. 30,397	4,221,185	4,230,801	4,236,835
3,753,334	4,222,776	4,230,987	4,237,275
3,934,469	4,222,896	4,231,424	4,237,425
4,007,196	4,223,040	4,231,475	4,238,004
4,048,194	4,223,732	4,231,663	4,238,265
4,070,250	4,224,476	4,231,759	4,238,432
4,137,897	4,224,800	4,231,942	4,238,752
4,157,350	4,225,567	4,232,130	4,239,035
4,175,655	4,225,964	4,232,161	4,239,286
4,179,501	4,226,491	4,232,175	4,239,692
4,183,500	4,226,675	4,232,278	4,239,732
4,185,797	4,226,862	4,232,563	4,239,896
4,190,228	4,226,984	4,233,065	4,239,979
4,190,693	4,227,001	4,233,219	4,240,093
4,196,283	4,227,127	4,233,425	4,240,854
4,197,257	4,227,251	4,233,448	4,240,905
4,200,624	4,227,632	4,233,815	4,240,983
4,202,615	4,228,089	4,234,040	4,241,414
4,203,048	4,228,202	4,234,073	4,241,713
4,203,569	4,228,348	4,234,333	4,241,826
4,207,420	4,228,537	4,234,564	4,241,992
4,208,512	4,228,587	4,234,595	4,242,316
4,208,538	4,229,159	4,234,602	4,242,493
4,209,449	4,229,282	4,234,626	4,242,494
4,209,521	4,229,333	4,234,650	4,242,724
4,209,637	4,229,343	4,234,710	4,242,842
4,210,748	4,229,434	4,234,746	4,242,970
4,215,336	4,229,959	4,234,755	4,243,038
4,215,583	4,230,037	4,235,220	4,243,175
4,216,698	4,230,127	4,235,225	4,243,368
4,217,501	4,230,277	4,235,345	4,243,470
4,218,254	4,230,294	4,235,653	4,243,701
4,220,205	4,230,346	4,235,668	4,244,392
4,220,661	4,230,708	4,235,686	4,245,586
4,221,064	4,230,753	4,236,819	4,246,474

Disclaimers

4,199,082.—*Robert L. Ornsteen,* Cape Neddick, Maine. HOT MELT ADHESIVE GUN. Patent dated Apr. 22, 1980. Disclaimer filed Jan. 9, 1981, by the assignee, *Ornsteen Chemicals, Inc.*

Hereby enters this disclaimer to claims 1, 3, 4, 5, 6, 7, 23 and 24 of said patent.

4,048,066.—*Dionisio Guerrero Cuisia,* Chicago and *Chih Ming Hwa,* Palatine, Ill. METHOD AND COMPOSITION OF INHIBITING SCALE. Patent dated Sept. 13, 1977. Disclaimer filed Aug. 14, 1980, by the assignee, *Chemed Corporation.*

Hereby enters this disclaimer to claim 1 of said patent.

Disclaimer and Dedication

4,009,259.—*Roland W. Ament,* Arvada, Colo. and *Daniel C. Fender,* Seattle, Wash. IMMERSION METHOD FOR TREATING AQUATIC ANIMALS. Patent dated Feb. 22, 1977. Dedication filed Feb. 10, 1981, by the assignee, *Wildlife Vaccines, Inc.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161, for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division, Room 2D 444
Pentagon, Washington, D.C. 20310

Patent 4,030,218. Segmented Map and Holder. Filed Sept. 7, 1976. Patented June 21, 1977. Not available NTIS.

Patent 4,154,141. Ultrafast, Linearly-Deflagration Ignition System. Filed May 17, 1977. Patented May 15, 1979. Not available NTIS.

Patent 4,159,679. Projectile Fuze. Filed Aug. 29, 1977. Patented July 3, 1979. Not available NTIS.

Patent 4,159,680. Random Delay Timer. Filed May 1, 1978. Patented July 3, 1979. Not available NTIS.

Patent 4,160,415. Target Activated Projectile. Filed May 5, 1978. Patented July 10, 1979. Not available NTIS.

Patent 4,160,416. Programmed Self-Destruct System for a Munition. Filed Apr. 20, 1978. Patented July 10, 1979. Not available NTIS.

Patent 4,160,927. Ferroelectric Ceramic Devices. Filed Apr. 5, 1977. Patented July 10, 1979. Not available NTIS.

Patent 4,161,070. Laser Rangefinder Trainer. Filed June 20, 1978. Patented July 17, 1979. Not available NTIS.

Patent 4,161,760. Short Circuit Protection of Regulated Power Supplies. Filed May 22, 1978. Patented June 17, 1979. Not available NTIS.

Patent 4,163,238. Infrared Semiconductor Device With Superlattice Region. Filed June 9, 1978. Patented July 31, 1979. Not available NTIS.

Patent 4,163,328. Moving Target Screen With Improved Optical Control. Filed Mar. 10, 1978. Patented Aug. 7, 1979. Not available NTIS.

Patent 4,163,845. Recycle of Spent Acid in Nitrolysis of Hexamine to RDX. Filed Apr. 26, 1978. Patented Aug. 7, 1979. Not available NTIS.

Patent 4,164,700. High Pressure Apparatus for Microwave Resonance Spectroscopy. Filed May 8, 1978. Patented Feb. 14, 1979. Not available NTIS.

Patent 4,164,888. Rocket Remote Engagement Mechanism. Filed Sept. 1, 1977. Patented Aug. 21, 1979. Not available NTIS.

Patent 4,165,081. Constant Force Face Seal. Filed Apr. 14, 1978. Patented Aug. 21, 1979. Not available NTIS.

Patent 4,165,906. Track Shoe Having Replaceable Pad. Filed Feb. 15, 1978. Patented Aug. 28, 1979. Not available NTIS.

Patent 4,166,874. Crashworthy Fuel Cell Repair. Filed Sept. 22, 1978. Patented Sept. 4, 1979. Not available NTIS.

Patent 4,167,010. Terminated Microstrip Antenna. Filed Mar. 13, 1978. Patented Sept. 4, 1979. Not available NTIS.

Patent 4,167,428. Conductance Method for Determining the Mechanical Properties of Propellants. Filed May 17, 1974. Patented Sept. 11, 1979. Not available NTIS.

Patent 4,167,463. Nitrogen Fixation With a High Energy Laser. Filed Apr. 12, 1978. Patented Sept. 11, 1979. Not available NTIS.

Patent 4,167,666. Multi-Grating Attenuator for High Power Pulsed Laser Beams. Filed Apr. 28, 1978. Patented Sept. 11, 1979. Not available NTIS.

Patent 4,167,905. Hand Grenade Fuze With Self-Induced Spin for Arming. Filed Sept. 1, 1977. Patented Sept. 18, 1979. Not available NTIS.

Patent 4,168,931. Freight Container Transport. Filed Sept. 26, 1977. Patented Sept. 25, 1979. Not available NTIS.

Patent 4,169,236. Rotation of Characteristic Vectors With Piezoelectric Coupling. Filed Dec. 30, 1977. Patented Sept. 25, 1979. Not available NTIS.

Patent 4,169,265. P-Band Loop Antennas in Radial Array. Filed May 4, 1978. Patented Sept. 25, 1979. Not available NTIS.

Patent 4,170,757. Method of and Apparatus for Transmitting Clandestine Radio Signals. Filed Dec. 30, 1977. Patented Oct. 9, 1979. Not available NTIS.

Patent 4,171,663. Tension Fracture Fitting in Missile Separation Thruster. Filed Nov. 22, 1977. Patented Oct. 23, 1979. Not available NTIS.

Patent 4,172,410. Helical Lock for Automatic Gun. Filed Jan. 23, 1978. Patented Oct. 30, 1979. Not available NTIS.

Patent 4,172,570. Landing Gear In-Flight Vibration Dampener. Filed Jan. 13, 1978. Patented Oct. 30, 1979. Not available NTIS.

Patent 4,173,017. Programmable Signal Processor for Doppler Filtering. Filed Apr. 11, 1977. Patented Oct. 30, 1979. Not available NTIS.

Patent 4,173,186. Ammunition. Filed July 7, 1960. Patented Nov. 6, 1979. Not available NTIS.

Patent 4,173,187. Multipurpose Protection System. Filed Sept. 22, 1967. Patented Nov. 6, 1979. Not available NTIS.

Patent 4,174,137. Control Rod Roll-Over Limiter. Filed July 24, 1978. Patented Nov. 13, 1979. Not available NTIS.

Patent 4,175,913. Helicopter Rotor Head Mounting Assembly. Filed Jan. 13, 1978. Patented Nov. 27, 1979. Not available NTIS.

Patent 4,176,392. Series Induction/Parallel Inverter Power Stage and Power Staging Method for DC-DC Power Converter. Filed Dec. 14, 1977. Patented Nov. 27, 1979. Not available NTIS.

Patent 4,176,608. Electrically Energized Impact Detonated Projectile With Safety Device. Filed May 8, 1978. Patented Dec. 4, 1979. Not available NTIS.

Patent 4,178,099. Scanning Optical Spectral Analyzer. Filed Oct. 31, 1977. Patented Dec. 11, 1979. Not available NTIS.

Patent 4,178,832. Automatic Gun Having Gas Leakage Control Mechanism. Filed May 25, 1978. Patented Dec. 18, 1979. Not available NTIS.

Patent 4,178,851. Dual Purpose Munition. Filed Mar. 8, 1972. Patented Dec. 18, 1979. Not available NTIS.

Patent 4,179,085. Optical Boresight Method for Nutating System. Filed Jan. 3, 1978. Patented Dec. 18, 1979. Not available NTIS.

Patent 4,179,088. Offset Beacon Homing. Filed Nov. 17, 1976. Patented Dec. 18, 1979. Not available NTIS.

Patent 4,179,599. Laser Plasmatron. Filed May 8, 1978. Patented Dec. 18, 1979. Not available NTIS.

Patent 4,179,792. Low Temperature CMOS/SOS Process Using Dry Pressure Oxidation. Filed Apr. 10, 1978. Patented Dec. 25, 1979. Not available NTIS.

Patent 4,179,795. Method for Forming a Drive Hole in Arc Plasma Spray Fabricated Ferrite Phasors. Filed June 15, 1978. Patented Dec. 25, 1979. Not available NTIS.

Patent 4,179,992. Primer-Igniter for Gun Propellants. Filed Apr. 4, 1978. Patented Dec. 25, 1979. Not available NTIS.

Patent 4,180,424. Control of Burning Rate and Burning Rate Exponent by Particle Size in Gun Propellants. Filed July 11, 1977. Patented Dec. 25, 1979. Not available NTIS.

Patent 4,180,535. Method of Bonding Propellants Containing Mobile Constituents. Filed Sept. 5, 1978. Patented Dec. 25, 1979. Not available NTIS.

Patent 4,180,599. Crosslinking Photoinitiators of Acrylic Benzophenonetetracarboxylates. Filed Aug. 25, 1978. Patented Dec. 25, 1979. Not available NTIS.

Patent 4,180,754. Geiger-Mueller Tube With a Re-Entrant Insulator at Opposing Sealed Ends Thereof. Filed Mar. 6, 1978. Patented Dec. 25, 1979. Not available NTIS.

Patent 4,183,097. Body Armor for Women. Filed Aug. 10, 1978. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,183,215. Pedal Linkage Hydraulic Brake Booster. Filed July 22, 1977. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,184,117. Communication Security Method and System. Filed Apr. 16, 1956. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,185,244. High Voltage Nanosecond Pulser Using a Repetitive Series Interrupter. Filed Apr. 12, 1978. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,185,289. Spherical Antennas Having Isotropic Radiation Patterns. Filed Sept. 13, 1978. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,185,796. Fiber Optic Missile Guidance and Control. Filed Dec. 13, 1976. Patented Jan. 29, 1980. Not available NTIS.

Patent 4,186,040. "BZ" Containing Pyrotechnic Compositions. Filed Dec. 2, 1964. Patented Jan. 29, 1980. Not available NTIS.

Patent 4,186,046. Growing Doped Single Crystal Ceramic Materials. Filed Nov. 28, 1977. Patented Jan. 29, 1980. Not available NTIS.

Patent 4,187,351. IMVIC Test Method. Filed Nov. 25, 1977. Patented Feb. 5, 1980. Not available NTIS.

Patent 4,187,458. Constant Power Regenerative Magnetic Switching Regulator. Filed Aug. 7, 1978. Patented Feb. 5, 1980. Not available NTIS.

Patent 4,187,501. Electronic Intruder Detection System. Filed Oct. 7, 1977. Patented Feb. 5, 1980. Not available NTIS.

Patent 4,187,723. Liquid Nitrogen Level Indicator. Filed Oct. 16, 1978. Patented Feb. 12, 1980. Not available NTIS.

Patent 4,187,782. Shaped Charge Device. Filed Apr. 26, 1978. Patented Feb. 12, 1980. Not available NTIS.

Patent 4,187,783. Discarding Sabot Munition. Filed Mar. 13, 1978. Patented Feb. 12, 1980. Not available NTIS.

Patent 4,188,503. Digital Data Communications System. Filed July 5, 1978. Patented Feb. 12, 1980. Not available NTIS.

Patent 4,188,576. Angular Rate Sensor. Filed Sept. 11, 1978. Patented Feb. 12, 1980. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–4, Washington, D.C. 20546

Patent application 6–165,910. Multibeam Single Frequency Synthetic Aperture Radar Processor for Imaging Separate Range Swaths. Filed July 3, 1980.

Patent application 6–168,995. Electrical Self-Aligning Connector. Filed July 15, 1980.

Patent application 6–171,933. Liquid Immersion Apparatus for Minute Articles. Filed July 18, 1980.

Patent application 6–175,453. Improved Low-Drag Ground Vehicle Particularly Suited for Use in Safely Transporting Livestock. Filed Aug. 5, 1980.

Patent application 6–185,865. Pocket Ecg Electrode. Filed Sept. 11, 1980.

Patent application 6–185,867. Improving the Efficiency of Silicon Solar Cells Containing Chromium. Filed Sept. 11, 1980.

Patent application 6–185,869. Multiple Pure Tone Elimination Strut Assembly. Filed Sept. 11, 1980.

Patent 4,118,427. Curable Liquid Hydrocarbon Prepolymers Containing Hydroxyl Groups and Process for Producing Same. Filed June 28, 1973. Patented Oct. 3, 1980. Not available NTIS.

Patent 4,196,129. Prepolymer Dianhydrides. Filed Aug. 14, 1978. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,210,278. Apparatus for Supplying Conditioned Air at a Substantially Constant Temperature and Humidity. Filed Feb. 6, 1979. Patented July 1, 1980. Not available NTIS.

Patent 4,214,226. System for Plotting Subsoil Structure and Method Therefor. Filed Sept. 6, 1977. Patented July 22, 1980. Not available NTIS.

Patent 4,214,703. Aircraft Engine Nozzle. Filed Mar. 23, 1979. Patented July 29, 1980. Not available NTIS.

Patent 4,214,902. High Toughness-High Strength Iron Alloy. Filed Jan. 25, 1979. Patented July 29, 1980. Not available NTIS.

Patent 4,215,273. Multispectral Scanner Optical System. Filed Mar. 29, 1979. Patented July 29, 1980. Not available NTIS.

Patent 4,215,327. Support Assembly for Cryogenically Coolable Low-Noise Choke Waveguide. Filed Aug. 31, 1978. Patented July 29, 1980. Not available NTIS.

Patent 4,215,345. Interferometric Locating System. Filed Aug. 31, 1978. Patented July 29, 1980. Not available NTIS.

Patent 4,215,590. Belt for Transmitting Power From a Cogged Driving Member to a Cogged Driven Member. Filed Sept. 18, 1978. Patented Aug. 5, 1980. Not available NTIS.

Patent 4,215,592. Redundant Motor Drive System. Filed Aug. 4, 1978. Patented Aug. 5, 1980. Not available NTIS.

Patent 4,218,280. Method of Cross-Linking Polyvinyl Alcohol and Other Water Soluble Resins. Filed Dec. 20, 1978. Patented Aug. 19, 1980. Not available NTIS.

Patent 4,218,633. Hydrogen Hollow Cathode Ion Source. Filed Oct. 23, 1978. Patented Aug. 19, 1980. Not available NTIS.

Patent 4,218,650. Apparatus for Measuring Semiconductor Device Resistance. Filed June 23, 1978. Patented Aug. 19, 1980. Not available NTIS.

Patent 4,218,682. Multiple Band Circularly Polarized Microstrip Antenna. Filed June 22, 1979. Patented Aug. 19, 1980. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
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Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Public Library of Cincinnati & Hamilton County	(513) 369-6936
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 12 o'clock noon and 5 :00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 29, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus: Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-23-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides: Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids: Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-10-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	9-11-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	12-12-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-5-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-8-79
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	7-2-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-9-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-21-78
DESIGNS, GROUP 290—Vacant. Industrial Arts; Household, Personal and Fine Arts.	1-8-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-18-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-20-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-1-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	6-1-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports: Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during November 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,109,176 to 3,112,486, inclusive
Plant Patents ..... Numbers 2,295 to 2,323, inclusive

REISSUES

MARCH 24, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,549
PNEUMATIC TIRE

Henri J. Mirtain, Compiegne, France, and Jonathan Mishory, Birmingham, Mich., assignors to Uniroyal, Inc., Middlebury, Conn. and Uniroyal S.A., Clairoix, France

Original No. 3,976,115, dated Aug. 24, 1976, Ser. No. 489,687, Jul. 18, 1974. Application for reissue Oct. 23, 1978, Ser. No. 953,653

Int. Cl.[3] **B60C** *9/22*

U.S. Cl. 152—361 R **5 Claims**

1. A pneumatic tire comprising a cord reinforced carcass, a tread overlying the crown region of said carcass, a reinforcing breaker *having a cross-sectional curvature along its entire width only in a radially inward direction for all normal operating conditions of said tire and* comprising a plurality of rubberized layers interposed between said tread and the crown region of said carcass, each layer having parallel cords oriented at an angle in the range of greater than 0° to 30° relative to the median equatorial plane of the tire, the angle of the cords in each layer being opposed relative to the angle of the cords in another layer, first and second buttress regions disposed radially inward of and adjacent to the respective first and second shoulders of the tread, first and second axially directed annular protuberances formed in the corresponding first and second buttress regions, each of said protuberances having a radially external surface positioned radially inward of the surface of said tread while the tread is in engagement with the road surface in a non-flotation situation and the tire is carrying normal load and in normal operation including straight line running, cornering or breaking, and the lateral side edges of the cords in each layer of said reinforcing breaker extend into said protuberances.

Re. 30,550
AUTOMATIC TRAILER SWAY SENSING AND BRAKE APPLYING SYSTEM

Herman A. Reise, Lakewood, N.J., assignor to Durrell U. Howard, San Antonio, Tex.

Original No. 4,040,507, dated Aug. 9, 1977, Ser. No. 629,603, Nov. 6, 1975. Application for reissue Apr. 18, 1979, Ser. No. 31,091

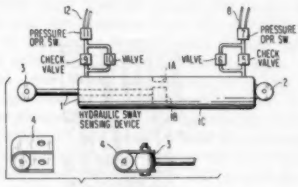
Int. Cl.[3] **B60T** *7/20*

U.S. Cl. 188—112 A **12 Claims**

1. A sway control system for controlling brakes of a towed vehicle in response to the detection of a sway condition comprising:

a hydraulic unit having first and second ends mounted to coupling means between the towed vehicle and a towing vehicle, which hydraulic unit includes first and second fluid passages associated with said first and second ends of the unit, each passage including a check valve shunted by a bypass restricted orifice and a pressure switch, and

an electric brake circuit for applying and releasing the brakes of the towed vehicle in response to said pressure switches being opened or closed, said hydraulic unit constituting a sway detection device for sensing the onset of a



sway condition of a towed vehicle relative to a towing vehicle.

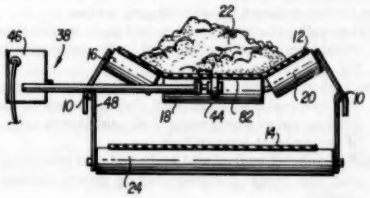
Re. 30,551
BELT SWITCH

Frank K. Hurt, and Edwin L. Wellons, both of North Tazewell, Va., assignors to Mefcor, Inc., Bluefield, Va.

Original No. 4,088,222, dated May 9, 1978, Ser. No. 771,855, Feb. 23, 1977. Application for reissue Jul. 16, 1979, Ser. No. 58,229

Int. Cl.[3] **B65G** *43/00;* **H01H** *35/02, 9/00;* **G08B** *21/00*

U.S. Cl. 198—502 **22 Claims**



1. An endless conveyor monitoring switch system to be mounted on an endless conveyor support adjacent to an endless conveyor for monitoring the movement of said endless conveyor, said switch system comprising:

an elongated frame;

a shaft journaled for rotation in said frame and extending longitudinally along said frame;

a drive wheel attached to and rotatable with said shaft said drive wheel being positioned near a first end of said elongated frame;

a detecting means attached to said shaft near the opposite end of said elongated frame for detecting when said shaft is rotating above a predetermined velocity;

a seesaw mounting means attached to said elongated frame at a location intermediate to said drive wheel and said detecting means for mounting said elongated frame on said endless conveyor support and allowing said elongated frame to pivot freely in a seesaw manner with the weight of said frame and its attachments causing pivoting of said frame to bring said drive wheel into contact with said endless conveyor, said seesaw mounting means comprising a substantially U-shaped channel member means positioned crosswise of said elongated frame for portably straddling an elongated support member extending parallel to said endless conveyor.

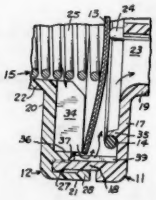
Re. 30,552
FUEL VAPOR VENT VALVE

George C. Ludwig, Owosso, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.

Original No. 4,142,677, dated Mar. 6, 1979, Ser. No. 810,079, Jun. 27, 1977. Application for reissue Jun. 25, 1979, Ser. No. 51,710

Int. Cl.[3] **F16K** *24/04*

U.S. Cl. 236—101 E **15 Claims**



1. A fuel vapor vent valve comprising
a plastic body including a base wall and a peripheral wall,
a plastic cap including a base wall and a peripheral wall surrounding the peripheral wall of the plastic body,
said peripheral wall of said body having a radially outwardly extending annular rib,
said base walls having openings therein,
said peripheral wall of said cap having a radially inwardly extending rib,
said ribs being adapted to pass over one another to provide a snap fit during assembly,
said base wall of said body having integral O-ring retaining means,
an O-ring retained by said integral means,
a bi-metallic disc positioned in said body within the confines of said peripheral wall of said body and normally engaging said O-ring,
integral stop means on said cap adapted to be engaged by said bi-metal disc when said disc is caused to move to a position out of engagement with said O-ring upon increase of the ambient temperature,
said peripheral wall of said body and said peripheral wall of said cap being [ultrasonically] *fusion* welded to one another,
said peripheral wall of said body engaging the base wall of said cap.

Re. 30,553
METAL ORGANOPHOSPHORUS COMPOUNDS

Samuel E. Harson, Warrington, and Edward Fogg, Longsight, both of England, assignors to Borax Holdings Limited, London, England

Original No. 3,467,683, dated Sep. 16, 1969, Ser. No. 512,020, Dec. 6, 1965. Application for reissue Dec. 7, 1979, Ser. No. 101,491

Claims priority, application United Kingdom, Dec. 9, 1964, 50183/64

Int. Cl.[3] **C09F** *1/00;* **C11D** *15/00;* **A23J** *7/00*

U.S. Cl. 260—105 **11 Claims**

1. A metal organic *phosphate* compound which consists of a phosphorus atom, [n]
three divalent metal atoms selected from the group consisting of calcium, zinc, cadmium, cobalt, manganese, copper, magnesium, barium, lead, and zirconium in the form of the zirconyl radical =ZrO, [wherein n is an integer from 1-3,] **each linked to the phosphorus atom through an oxygen atom,**
and a carboxylic acid group of up to 30 carbon atoms selected from the group consisting of Versatic acid, tall oil fatty acids and 8 to 10 *carbon-atom containing* isoacids *also* attached to each divalent metal atom [and 3-n groups selected from the group consisting of hydroxy groups, alkoxy groups of up to 4 carbon atoms and phenyl groups] *through the carboxylic radical,*
the phosphorus atom additionally having an oxygen atom attached to it through a double bond.

Re. 30,554
COORDINATION COMPLEXES AS CATALYSTS

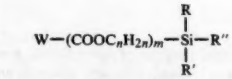
Kurt Weinberg, Upper Saddle River, N.J., and Gordon C. Johnson, Armonk, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Original No. 4,143,057, dated Mar. 6, 1979, Ser. No. 773,001, Feb. 28, 1977. Application for reissue Jun. 11, 1979, Ser. No. 47,350

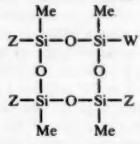
Int. Cl.[3] **C07F** *7/30, 7/28, 7/22, 7/00*

U.S. Cl. 260—429 R **13 Claims**

1. A coordination complex of:
(A) a metal halide of a metal selected from the group consisting of titanium, zirconium, zinc, germanium tin, lead, antimony and bismuth; and
(B) a silicon compound selected from the group consisting of:

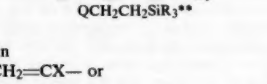


(I)



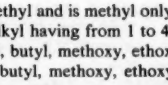
(II)

(III)



(IV)

wherein
W is $CH_2{=}CX-$ or



X is hydrogen or methyl and is methyl only when m is one;
R* is alkyl or haloalkyl having from 1 to 4 carbon atoms;
R** is methyl, ethyl, butyl, methoxy, ethoxy or butoxy;
R is methyl, ethyl, butyl, methoxy, ethoxy, butoxy or trimethylsiloxy;
R′ is methyl, methoxy, ethoxy, butoxy or trimethylsiloxy;
R″ is methoxy, ethoxy, butoxy, trimethylsiloxy or vinyldimethylsiloxy;
R‴ is methyl, ethyl, butyl or trimethylsilyl;
Me is methyl;
Z is methyl or W; Q is [NH_2CH_2-, $NH_2CH_2CH_2NHCH_2-$,] NC—, HS— or $HSCH_2CH_2S-$ group;
n is an integer having a value of from 2 to 5;
m is an integer having a value of zero or one;
x is an integer having a value of from 1 to 100; and
y is an integer having a value of from 1 to 100;
wherein the mole ratio of A:B in said coordination complex is from 1:1 to 1:7.

Re. 30,555

METHOD OF PRODUCING STRING OF POLYAMIDE AND STRINGED RACKETS WITH SUCH STRING

Harry Ferrari, 144 W. Swissvale Ave., Pittsburgh, Pa. 15218

Original No. 4,015,133, dated Mar. 29, 1977, Ser. No. 656,808, Feb. 10, 1976. Continuation-in-part of Ser. No. 540,794, Jan. 14, 1975, abandoned. Application for reissue Nov. 8, 1979, Ser. No. 92,359

Int. Cl.[3] **A61K** *27/02*

U.S. Cl. 250—492 R **7 Claims**

1. The method of substantially improving [the elasticity and decreasing and damping of] *stringed rackets having* string composed of polyamide [for stringed apparatus] which comprises *improving the elasticity and decreasing the damping of said string by* irradiating the string with [radition] *radiation*, the magnitude of the energy of said radiation being in the range between the energy for which cleavage is predominately produced and the energy for which linkage alone is produced, so that a decrease in the modulus of elasticity of the treated string is accompanied by a decrease in the damping loss coefficient of the treated string.

Re. 30,556

INDICATING ELEMENT AND METHOD OF MANUFACTURING SAME

Toru Teshima, Hatano; Hoichiro Kashiwabara, Hino, and Yoshinori Uchiyama, Machida, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Original No. 4,019,196, dated Apr. 19, 1977, Ser. No. 625,685, Oct. 24, 1975. Application for reissue Jan. 26, 1979, Ser. No. 6,661

Claims priority, application Japan, Nov. 22, 1974, 49-134971; Feb. 25, 1975, 50-25852[U]; Feb. 25, 1975, 50-25853[U]; Feb. 25, 1975, 50-25854[U]

Int. Cl.[3] **H01L** *33/00*

U.S. Cl. 357—17 **15 Claims**

21. An indicating element comprising:

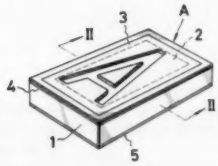
a semiconductor base plate (1) having opposing front and rear surfaces, said semiconductor base plate being of a first conductivity type;

a first planar semiconductor layer (2) of a second conductivity type opposite to that of said first conductivity type embedded in one of said front and rear surfaces of said base plate (1) to define an exposed junction therebetween, said base plate (1) and said first planar layer (2) forming a luminescent diode;

a first protective layer (4) over the exposed junction between said base plate (1) and first planar layer (2);

a first electrode mask layer (3) on said first planar layer (2), base plate (1) and first protective layer (4), said first electrode mask layer (3) defining a predetermined human intelligence conveying and information carrying indicating pattern, said first electrode mask layer having void portions and light blocking portions, said light blocking portions extending around the periphery of said first planar layer (2) and also extending inwardly over a substantial interior surface portion of said first planar layer (2) to define the boundaries of said predetermined indicating pattern;

a second planar semiconductor layer (20) of said second conductivity type on the other of said front and rear surfaces of said base plate (1) and defining an exposed junction with said



base plate, said base plate (1) and said second planar layer (20) forming a luminescent diode;

a second protective layer (4') over the exposed junction between said base plate (1) and said second planar layer (20); and

a second electrode mask layer (30) on said second planar layer (20), base plate (1) and second protective layer (4'), said second electrode mask layer (30) defining a predetermined human intelligence conveying and information carrying indicating pattern, said second electrode mask layer having void portions and light blocking portions, said light blocking portions extending around the periphery of said second planar layer (20) and also extending inwardly over a substantial interior surface portion of said second planar layer (20) to define the boundaries of said last-mentioned predetermined indicating pattern;

whereby when electric power is applied across said first and second electrode mask layers (3,30) light is emitted from said luminescent diode at the surfaces of said first and second planar layers (2,20), said light being blocked by said light blocking portions of said electrode mask layers and passed through said void portions to display said predetermined indicating patterns.

PLANT PATENTS

GRANTED MARCH 24, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,675

ASPARAGUS PLANT

Frank H. Takatori, and Franklin D. Souther, both of Riverside, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 19, 1979, Ser. No. 105,171
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—89 **1 Claim**

1. The new and distinct variety of asparagus plant herein described and illustrated and identified by the characteristics enumerated above.

4,676

SEMI-SPUR MUTANT STRAIN OF GRANNY SMITH APPLE TREE

Calvin Cooper, Brewster, Wash., assignor to Granspur Enterprises, Orondo, Wash.

Filed Jan. 22, 1979, Ser. No. 5,294
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of Granny Smith apple tree, substantially as described and illustrated, characterized by its semi-spur growth characteristics with internodal spacing generally intermediate that of the standard Granny Smith variety and the Hannaford variety (U.S. Plant Pat. No. 3,453), and by its fruit having distinct dark green stripes, the predominant color of Hannaford fruit, superimposed on a slightly mottled lighter green color, the predominant color of standard Granny Smith fruit.

4,677

ASPARAGUS PLANT

Frank H. Takatori, and Franklin D. Souther, both of Riverside, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 19, 1979, Ser. No. 105,431
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—89 **1 Claim**

1. The new and distinct variety of asparagus plant herein described and illustrated and identified by the characteristics enumerated above.

PATENTS

GRANTED MAR. 24, 1981

ERRATA

For CLASS	See PATENT NO.
434–188	4,257,174
434–208	4,257,175
411–387	4,257,307
411–354	4,257,308
493–068	4,257,316
493–059	4,257,317
181–172	4,257,325
411–371	4,257,466
369–267	4,257,614
369–244	4,257,615
015–230	4,257,616
403–031	4,257,714
075–001 R	4,257,881
564–454	4,257,979
564–336	4,257,980
564–454	4,257,981
564–453	4,257,982
564–346	4,257,983
564–336	4,257,984
568–308	4,257,985
568–934	4,257,986
264–001.1	4,257,988
423–258	4,258,048
219–010.43	4,258,086
369–033	4,258,233
568–350	4,258,268
340–765	4,258,364
318–782	4,258,368

PATENTS

GRANTED MARCH 24, 1981

GENERAL AND MECHANICAL

4,257,127

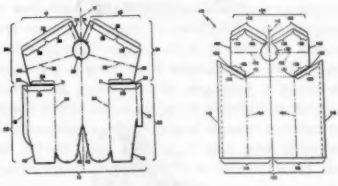
INFANT GARMENT, BLANK THEREFOR, AND METHOD OF MAKING THE GARMENT

William B. Kaupin, Westwood, and Stephen P. Szczesuil, Framingham, both of Mass., assignors to The William Carter Company, Needham Heights, Mass.

Filed Mar. 12, 1979, Ser. No. 19,349

Int. Cl.[3] **A41D** *11/00*

U.S. Cl. 2—75 **15 Claims**



1. A blank for at least a major portion of an infant's garment, said blank being generally symmetric about a longitudinal midline defining right and left blank parts,

each said blank part having a lateral free edge generally parallel to said midline, and a single rectilinear cut extending inwardly from said lateral free edge toward said midline to an interior point approximately one-half the perpendicular distance from said lateral free edge to said midline,

said right and left cuts together with the line connecting said right and left interior points dividing said blank generally into a lower body portion and a shoulder/arm portion,

each said cut defining parallel closely spaced opposed edges comprising a median seam edge bordering said lower body portion and an under-sleeve seam edge bordering said shoulder/arm portion,

said blank shoulder-arm portion providing a garment neck opening lying on said midline,

each said blank part having an upper free edge lying between the line of said lateral free edge and said midline,

each said upper free edge comprising a proximal portion adjacent said midline and a distal portion remote therefrom,

the said upper free edge distal portion and said under-sleeve seam edge of a blank part being opposable to define an under-sleeve seam, and the said upper free edge proximal portion and said median seam edge of said blank part being opposable to define a median seam,

said midline dividing said lower body portion into left and right lower body portions,

each of said left and right lower body portions comprising two areas lying one on either side of a lateral fold line extending from said interior point to the bottom of said blank parallel with said midline, the area lying between said line and said lateral free edge being at least as great as the area lying between said line and said midline.

9. A blank for at least a major portion of an infant's garment, said blank being generally symmetrical about a longitudinal midline defining right and left blank parts,

each said blank part having a lateral free edge generally parallel to said midline, and a cut extending inwardly from said lateral free edge generally perpendicular to said midline for approximately one-half the width of said blank part measured from said lateral free edge to said midline,

the line of said cut dividing said blank part into a lower body portion and a shoulder/arm portion, said cut defining opposed edges comprising a median seam edge bordering said lower body portion and an under-sleeve seam edge bordering said shoulder/arm portion,

said right and left shoulder/arm portions together providing a garment neck opening lying on said midline,

each said blank part shoulder/arm portion having a generally straight upper free edge inclined upwardly from the line of said lateral free edge toward said midline, and a placket edge extending between said upper free edge and said garment neck opening, said placket edge being generally perpendicular to said upper free edge,

each said upper free edge comprising a proximal portion adjacent said placket edge, and a distal portion remote therefrom,

the said upper free edge distal portion and said under-sleeve seam edge of a blank part being opposable to define an under-sleeve seam, and the said upper free edge proximal portion and said median seam edge of said blank part being opposable to define a median seam.

4,257,128

ENDOPROSTHETIC KNEE JOINT

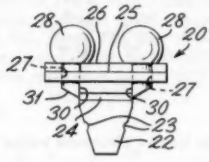
John T. Scales, Stanmore, and Keith W. J. Wright, Ruislip, both of England, assignors to National Research Development Corporation, London, England

Filed May 9, 1979, Ser. No. 37,514

Claims priority, application United Kingdom, May 12, 1978, 19225/78

Int. Cl.[3] **A61F** *1/03*

U.S. Cl. 3—1.911 **6 Claims**



1. An endoprosthetic knee joint device comprising:

a femoral component adapted on one side thereof for securement to the femur and formed on the opposite side thereof with two transversely spaced sockets; a tibial component including a base part adapted on one side thereof for securement to the tibia and formed with two transversely spaced apertures, two ball parts each having a ball and a stem projecting therefrom, said stems being separately and removably engageable in a respective one of said apertures on said base part from the side of said base part opposite to said one side thereof, said balls being in respective mutual articulatory engagement with said sockets.

4,257,129

PROSTHETIC KNEE JOINT TIBIAL IMPLANT

Robert G. Volz, 2705 Camino LaZorrela, Tucson, Ariz. 85718

Filed May 21, 1979, Ser. No. 41,084

Int. Cl.[3] **A61F** *1/03*

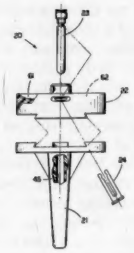
U.S. Cl. 3—1.911 **16 Claims**

1. A prosthetic implant for partial placement of natural bone at a point of articulation, said prosthetic implant comprising:

an anchoring insert member including an upper surface contoured to provide a laterally extending groove;

a replaceable articulation member slidably received in said laterally extending groove of said anchoring insert member;

a removable vertical pin member extending through said articulation member and into said anchoring insert member; and



a removable horizontal clip member extending into said articulation member and disposed about said vertical pin member.

4,257,130

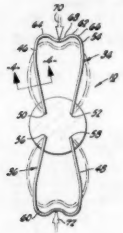
INTRAOCULAR LENS MECHANISM

Jon H. Bayers, 1042 Panadero Ct., Concord, Calif. 94521

Filed Aug. 27, 1979, Ser. No. 70,034

Int. Cl.³ A61F *1/16, 1/24*

U.S. Cl. 3—13 **6 Claims**



1. An intraocular lens for placement within an eye comprising:

a. a lens portion having an optical axis intended for placement adjacent one side of the iris;

b. a pair of appendages, each of said pair of appendages being fastened to said lens portion, at least one of said pair of appendages including a closed loop terminating with an outer end having a first portion fastened to said lens portion and intended for passing through the pupil of the eye, and a second portion connected to said first portion and intended for extending therefrom along the other side of the iris into contact with the extreme periphery of the eye with said outer end;

c. means for restricting flexure of said closed loop vertically inwardly or outwardly in relation to the plane of the iris while allowing lateral flexure generally normal to said optical axis in response to forces directed at said outer end along said eye periphery.

4,257,131

DEVICE TO APPLY A PAPER SHEET TO A CLOSET SEAT

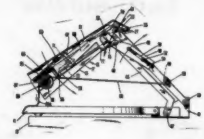
Gerardus M. Tromp, Van Alkemadelaan 1132, The Hague, Netherlands

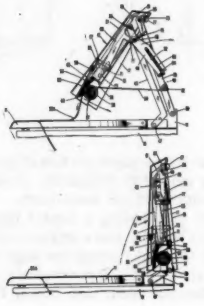
Filed Jun. 27, 1979, Ser. No. 52,950

Int. Cl.³ A47K *13/14, 13/16*

U.S. Cl. 4—246 **11 Claims**

1. A device for applying a paper sheet to a toilet seat comprising a container holding a stacked supply of paper sheets fitting said toilet seat, means supporting said container adjacent said toilet seat and including a mechanism operable to move said container from a substantially vertical position rearwardly of said toilet seat to a position over said seat and for returning the container to the vertical position, a paper sheet-feeding roller journaled on said container, drive means interconnected with said support means and operable to rotate said roller during at least a portion of the movement of said container,





means operable to press a paper sheet from said stacked supply against said paper sheet-feeding roller during that portion of container movement when said paper sheet is delivered from said container and applied to said toilet seat, and means responsive to the position of said support means for holding said paper sheetpressing means out of pressing engagement with said paper sheets when said container is in said substantially vertical position.

4,257,132

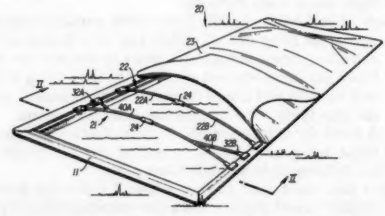
COLLAPSIBLE POOL COVER ASSEMBLY

Frederick A. Kerby, 507 Elizabeth Rd., Glen Burnie, Md. 21061

Continuation of Ser. No. 936,967, Aug. 25, 1978, abandoned. This application Sep. 24, 1979, Ser. No. 78,340

Int. Cl.³ E04H *3/19;* E04B *1/32;* A45F *1/02*

U.S. Cl. 4—498 **6 Claims**



1. An improved, collapsible swimming pool cover support assembly for providing the entire support for a swimming pool

cover even when weighed down by leaves, snow and the like and comprising:

a plurality of substantially arch-shaped support members free-standing relative to one another and extending substantially parallel to one another between, curved edge portions or copings of said swimming pool

foot means for making each said standing relative to one another to prevent lateral shifting substantially arch-shaped support members free or twisting of the arch shaped supports,

separate pairs of foot means extending between opposite end portions of said arch-shaped, free-standing support members and said pool coping for providing the entire lateral and transverse support for said respective free-standing support members;

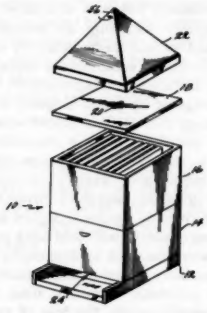
each of said foot means consisting of a T-shaped foot assembly including a base portion having an integral curved cross-sectional shape overlapping and engaging said swimming pool coping, each of said foot means further comprising a portion of substantially rigid construction fixedly and non-rotatably engaging a confronting end portion of one of said support members to fixedly postion said free-standing arch-shaped support member relative to said curved edge portion of said pool even when said support member is subjected to lateral forces, the portion of the foot means overlapping and engaging the coping being elongated in a direction parallel to the coping so as to prevent lateral shifting or twisting of the arch-shaped supports wherein said foot means constitute the sole support for said arch-shaped support members; a cover member placed over said arch-shaped supports for covering said pool.

4,257,133

SOLAR EVAPORATOR BEEHIVE COVER

John D. Steinrucken, 219 Terry Pky., Terrytown, La. 70053

Filed Aug. 7, 1978, Ser. No. 932,047
Int. Cl.³ A01K *47/06*
U.S. Cl. 6—1 **7 Claims**



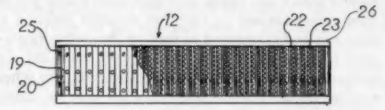
1. A beehive evaporation enhancing cover comprised of four triangular-shaped primary elements each having two side edges and a base edge, said elements being connected together along their side edges to form a one-piece structure so that an open V-shaped area is formed within the one-piece structure, the V-shaped area being defined by two unattached sides of two opposing elements, a securing strap extending from and running along one of the unattached sides defining the V-shaped area, each element having an overhang flap depending from and extending along the base edge, a plurality of the elements having means defining a ventilation opening for ventilating the hive, said opening positioned between the sides of said element and adjacent the apex thereof.

4,257,134

BEEHIVE

Mark J. Niebur, P.O. Box 753, Malta, Mont. 59538

Filed Dec. 17, 1979, Ser. No. 104,002
Int. Cl.³ A01K *47/00*
U.S. Cl. 6—1 **12 Claims**



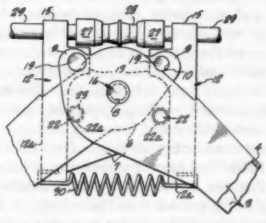
1. A beehive including a housing comprising a bottom portion, longitudinal sidewall portions extending upwardly from said bottom portion, retainer means associated with the upper free edges of said sidewall portions, removable end sections extending between said sidewall portions, said bottom portion including a plurality of spaced openings and a plurality of rib members located between said openings, a plurality of spacer strips disposed within said housing and extending between said sidewall portions, a plurality of plastic strips disposed with said housing and extending between said sidewall portions, said plastic strips being corrugated transversely of their length, said plastic strips being disposed between said spacer strips in an alternating relationship, said spacer and plastic strips not being bonded to each other but being separable and independent of one another, said strips being disposed closely adjacent to each other, said strips substantially completely filling said housing between said end sections, and a common backing member disposed between said bottom portion and the adjacent edges of said strips.

4,257,135

ASSEMBLY TOOL FOR TUBE FITTINGS

Kurt O. Moebius, Torrance, Calif., assignor to Hackforth GmbH & Co. KG, Herne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 856,499, Dec. 1, 1977, abandoned. This application Jul. 23, 1979, Ser. No. 59,752
Int. Cl.³ B25B *7/22*
U.S. Cl. 7—125 **6 Claims**



1. An assembly tool for tube joints, having opposed coaxial components capable of being secured by axial contraction, the assembly tool comprising:

a. a pair of bar members disposed in confronting coplanar relation, each having a bearing bore near one end, its opposite end being extended, the bearing bores being disposed in parallel relation;

b. a pair of handle members, each handle member including a pair of flat plates overlying opposite sides of the bar members, the plates of each handle member having first openings in registry with opposite ends of corresponding bearing bores, second openings defining a common axis spaced equally from the first openings, and third openings diametrically disposed with respect to the first openings;

c. journal pins for the first openings received in the bearing bore of each bar member, a main journal pin received in

the second openings and extending between the bar members, and stop pins received in the third openings, for engagement by the bar member extensions, the spacing of the pins being such that relative angular movement of the handle members causes coaxial movement of the bar members, each of said stop pins extending through said flat handle plates and being provided with a stop pin head;

d. tool means carried by each bar member defining a common axis and contoured to receive the components of the tube joint to effect axial contraction, each bar member being removable by removal of its journal pins whereby a tool means of different configuration may be substituted; and wherein

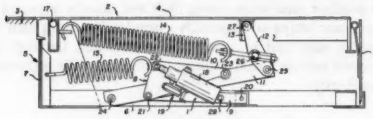
e. one plate of each handle member includes a portion of increased radius which overlies the head of the stop pin received in the other handle member to retain the stop pin in place, the contacting portions of the head and portion of increased radius forming a slide bearing to reduce friction.

4,257,136

HOLD-DOWN DEVICE FOR DOCKLEVELLER

Norton M Loblock, Edmonton, Canada, assignor to Argo Engineering Ltd., Edmonton, Canada

Filed May 21, 1979, Ser. No. 40,649
Int. Cl.³ E01D *1/00*
U.S. Cl. 14—71.3 **2 Claims**



1. A hold-down device for use in a dockleveller wherein a dockboard is pivotally mounted at its inner end to a base frame for rotation about said pivot between cross-traffic, fully raised and declined positions and wherein mechanical dockboard raising means are provided to rotate the dockboard upwardly from the declined and cross-traffic positions to the fully raised position, said hold-down device comprising:

a hydraulic cylinder assembly having a stem end and a base end and comprising a piston element, having a piston head, and a cylinder element within which the piston element reciprocates, said assembly being mountable so that one of the elements may be interconnected with the dockboard and the other element may be interconnected with the base frame, whereby the cylinder assembly may expand and contract respectively in response to the dockboard being raised and lowered;

said cylinder assembly having a fluid-filled stem chamber and a fluid-filled base chamber, the volume of fluid in the base chamber when the cylinder assembly is fully expanded being greater than the volume of fluid in the stem chamber when the cylinder assembly is fully contracted, said piston head being adapted to prevent fluid movement between the chambers;

said fluid in the base chamber comprising a body of compressible fluid;

first and second conduit means extending from the stem and base chambers;

check valve means connecting said conduit means and controlling fluid movement through the conduit means between the chambers;

said check valve means comprising a valve body forming a first valve chamber, a first port connecting the valve chamber with the conduit means communicating with the stem chamber, a second port connecting the valve chamber with the conduit means communicating with the base chamber, and a valve seat at the end of the valve chamber adjacent the second port, and

a valve member disposed in the valve chamber, for seating on the valve seat to prevent flow through the valve chamber;

first means for mechanically unseating the valve member to permit the cylinder assembly to be expanded as the dock-raising means raises the dockboard, said first means extending through the valve body wall in sealing engagement therewith and being exposed only to the low pressure in the base chamber;

said check valve means being operative to close if there is a greater fluid pressure in the stem chamber than in the base chamber and the first means is inoperative, thereby preventing expansion of the cylinder assembly;

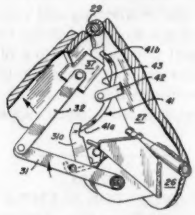
said valve means being operative to open if there is a greater fluid pressure in the base chamber than in the stem chamber, thereby permitting the cylinder assembly to contract.

4,257,137

DOCK LEVELER

Steven J. Hipp, Milwaukee, and Richard C. Wilde, Wauwatosa, both of Wis., assignors to Rite-Hite Corporation, Milwaukee, Wis.

Filed Aug. 23, 1979, Ser. No. 69,230
Int. Cl.³ E01D *1/00*
U.S. Cl. 14—71.3 **7 Claims**



1. A dock leveler comprising a fixedly mounted frame for disposition adjacent to the front edge of a dock loading surface; an extension assembly adjustably mounted on said frame for selective movement between operative and inoperative modes; said assembly including an elongated dock panel hingedly connected to said frame whereby said panel has an exposed surface thereof in substantially coplanar relation with the dock loading surface when the assembly is in an inoperative mode, an elongated lip panel hingedly connected to said dock panel, the hinge axes being in spaced substantially parallel relation, said lip panel assuming a depending non-extended position relative to said dock panel when said assembly is in said inoperative mode, and, when in an operative position, extending outwardly from said dock panel for engaging the load-supporting surface of a vehicle parked adjacent the dock loading surface and coacting with said dock panel for spanning a gap formed between the dock loading surface and the vehicle load-supporting surface, power means mounted on said frame and biasing said extension assembly from said inoperative mode to said operative mode, the bias of said power means being insufficient to effect movement of said assembly from said inoperative mode without a predetermined external pivoting force being applied thereto, a linkage interconnecting said frame and lip panel and including pivotally connected first and second arms, said first arm having an end thereof pivotally connected to said frame and said second arm having an end thereof pivotally connected to said lip panel, and an elongated trip member having a central section pivotally connected to and carried by said dock panel, one end section of said trip member engaging and being actuated by said one arm during a predetermined segment of travel of said extension assembly while moving from an inoperative mode to an operative mode, and a second end section of said trip member engaging and actuating said lip panel to assist movement thereof to an extended position relative to said dock panel only when said one

end section is in engagement with and actuated by said one arm.

4,257,138

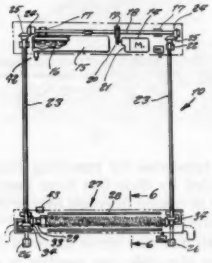
AUTOMATIC DEVICE FOR WASHING WINDOWS

Nicholas Clements, 23 Charlton St., New York, N.Y. 10014, and Richard L. Miller, 12 Parkside Dr., Dix Hills, N.Y. 11746

Filed Jul. 23, 1979, Ser. No. 59,981

Int. Cl.³ A47L *1/02*

U.S. Cl. 15—4 **2 Claims**



1. A window-washing device, comprising in combination, a case mounted outside a building wall and above a window, a rotatable screw adjacent each side edge of said window extending downwardly from said case, a two directional motor inside said case for rotating said screws, and a horizontal arm vertically movable between said rotating screws, said arm containing a rotatable brush that brushes across said window; a pivotable wiper blade above and below said brush for wiping across said window; a detergent solution tank inside said case, and means for transfer of said solution to said brush, said means including a solution-receiving container in said arm, a filler pipe of said container engaging a downward spout of said tank when said arm is in uppermost position, and a pipe from said container communicating with a collar in which a perforated core of said brush is journalled so as to transfer said solution inside said brush, and a first bevel gear on each opposite end of said core engaging a second bevel gear rotationally secured to each said screw but axially slidable respective thereto, each said second gear being retained between parallel ribs of a U-shaped bracket secured in said arm, and a threaded opening in each said rib engaging said screw.

4,257,139

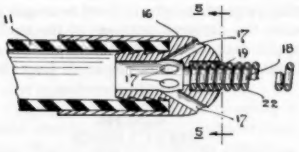
PLUMBING SNAKE-HOSE ATTACHMENT

Claude E. Yeo, 8501 Croydon, Los Angeles, Calif. 90045

Filed Apr. 20, 1979, Ser. No. 31,825

Int. Cl.³ B08B *9/02*

U.S. Cl. 15—104.3 SN **4 Claims**



1. A plumbing snake device for attachment to a water hose for use in clearing a plumbing line by simultaneous water action and mechanical action comprising

a hose section connected at one end thereof to said water hose,

a pressure nozzle connected to the other end of said hose section, said pressure nozzle having a central aperture and a plurality of radial apertures which are substantially smaller than said central aperture for emitting a pressurized radial water stream, and

a snake member having a central channel formed therein, one end of said snake member being attached to said pressure nozzle with the central channel thereof in fluid communication with the central aperture of said nozzle, a head portion on the opposite end of said snake member, said opposite end providing an outlet for said channel,

whereby a first radially directed pressurized water stream is provided through the radial apertures of said pressure nozzle aft of the snake member and a second axially directed water stream is provided from the opposite end of the snake member forward of the nozzle.

4,257,140

PAINTING DEVICE

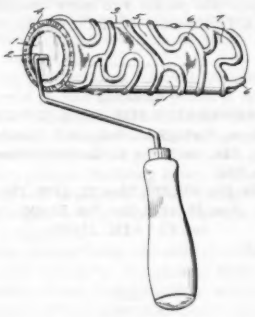
Stephen B. Downing, High Wycombe, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 16, 1979, Ser. No. 30,526

Claims priority, application United Kingdom, Apr. 28, 1978, 16946/78

Int. Cl.³ B05C *17/02*

U.S. Cl. 15—230.11 **14 Claims**



1. A sleeve for use with a conventional single roller paint roller applicator for modifying the ability of the paint roller comprising: a structure for forming a tube having an inside diameter of generally the same size as the outside diameter of a conventional paint roller, and having an exterior surface; and means associated with the exterior surface of said structure for providing a plurality of receptacles for thickened paint so that when a conventional single roller, over which said sleeve is exteriorly disposed, is disposed in thickened paint so that thickened paint is received by said receptacles, and when said roller with exteriorly disposed sleeve is moved along a substrate, thickened paint is expressed from the receptacles onto the substrate to provide a definite pattern of thickened paint on the substrate.

4,257,141

DEVICE FOR MODELLING OR PACKING AN OBJECT

Johannes van Brummelen, Barneveld, Netherlands, assignor to Moba Holding Barneveld B.V., Barneveld, Netherlands

Filed Nov. 28, 1978, Ser. No. 964,348

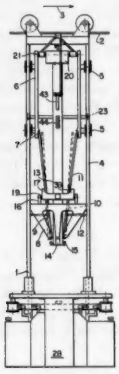
Claims priority, application Netherlands, Dec. 9, 1977, 7713639

Int. Cl.³ A22C *21/00*

U.S. Cl. 17—11 **12 Claims**

1. A device for modelling or packing an object comprising a container which is closable about said object, driving means for moving the container from a first position in which it has a first circumferential shape towards a second position in which it has a second circumferential shape which has a cross-sec-

tional area smaller than the cross-sectional area of the first circumferential shape, and said driving means including elastic means for resiliently moving the container from said first posi-



tion to said second position to hold the container as far as an over-sized object will permit it to move towards the second position, even if it has not moved all the way to the said second position.

4,257,142

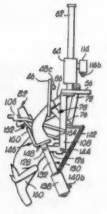
OPENING APPARATUS FOR POULTRY CARCASSES

Jack L. Hathorn, Springdale, Ark., and Donald J. Scheier, Kansas City, Mo., assignors to Gordon Johnson Company, Kansas City, Mo.

Division of Ser. No. 908,379, May 22, 1978. This application Apr. 26, 1979, Ser. No. 33,486

Int. Cl.[3] A22C *21/00*

U.S. Cl. 17—11 **4 Claims**



1. In apparatus for making a slit in the skin between a hole at the stern of a bird and its keel bone so as to provide an enlarged opening to the body cavity of the bird, the improvement comprising:

a bird holder movable along a prescribed course of travel;

a slitting knife movable with said holder; and

means for swinging said knife relative to said holder through a slitting stroke when the bird is retained by said holder whereby to prepare said slit,

said holder including means defining a pair of opposed clamping jaws operable to grip the thighs and legs of the bird in a substantially stationary condition relative to the holder during the slitting stroke while leaving the trunk portion of the bird otherwise unrestrained so as to properly locate said hole with respect to the knife yet permit yielding movement of the trunk portion generally in the direction of slitting movement of the knife to the extent necessary to avoid excessive slitting of the skin and damage to the keel bone.

4,257,143

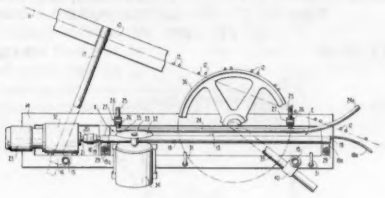
POULTRY DECAPITATING APPARATUS

Eugene J. Lewis, Rt. #1, Box 306, Demorest, Ga. 30536

Filed Jul. 16, 1979, Ser. No. 57,860

Int. Cl.[3] A22C *21/00*

U.S. Cl. 17—12 **7 Claims**



1. Decapitating apparatus for removing heads of poultry penduously suspended by their feet from vertically hanging shackles suspended at spaced intervals from a conveyor moving along a predetermined path comprising

two elongated rods mounted below the level of said shackles in juxtaposition alongside one another in a horizontally spaced-apart relationship with the spacing between said rods being such as to form a poultry neck guiding channel of a width sufficient to pass the poultry necks and insufficient to pass the heads,

said rods being aligned such that said conveyor predetermined path diverges horizontally at an acute angle from said channel between an entrance end of said channel adapted to engage the lower portions to include the necks of suspended poultry carried by the conveyor along said predetermined path and a channel exit end at which a first rod closest said conveyor path is at a lower horizontal level than the other of said rods,

a cutter blade mounted at said channel exit end for rotation about an axis extending transversely of said rods above said other rod and tilted at a small acute angle to the horizontal such that said blade is rotated in a vertically oriented plane passing beyond said other rod and through said first rod with the lower arc of said blade extending into a slot in said first rod,

means for rotating said cutter blade,

and diverting guide means between said channel entrance and exit ends contacting and diverting the shackled ends of poultry suspended from said conveyor from a normal path vertically below said conveyor predetermined path to a displaced path sufficiently offset horizontally from said normal path in a direction opposite said channel as will withdraw from within said channel all portions of poultry other than their necks with their heads captured below said rods contiguous to the rod lower surfaces and the necks aligned transversely of said channel and maintain the necks and heads in this position by the weight of the poultry bodies having their centers of gravity horizontally offset transversely of said channel between the diverging paths of said channel and conveyor during movement of the captured portions of the necks along said channel into the vertically oriented plane of movement of said cutter blade severing the heads from the necks.

4,257,144

MEAT TAPPER

Katsuki Takegoshi, Kyoto, and Kiyomi Ono, Osaka, both of Japan, assignors to Takegoshi Industry and Ohyodo Kinzoku Kogyo, both of Japan

Filed Jul. 13, 1978, Ser. No. 924,178

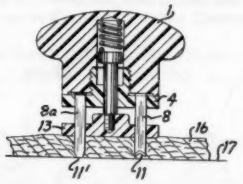
Int. Cl.[3] A22C *9/00*

U.S. Cl. 17—30 **7 Claims**

1. A meat tapper comprising:

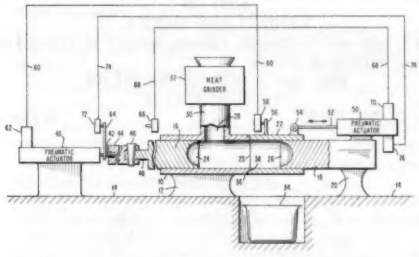
(a) a head;

(b) a blade carrier detachably secured to said head;
(c) said blade carrier carrying a plurality of blades with their edges downwardly directed;
(d) a blade guide having slits for passing said blades through;
(e) guiding means for enabling translation of said blade guide with respect to said blade carrier, thereby enabling the blade guide to be stationary on the meat;



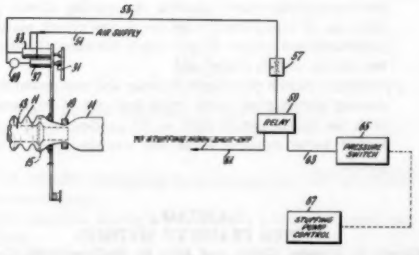
(f) a spring means provided between said head and said blade guide so as to enable said blade guide to return to its original position when the same is freed from the meat; and
(g) said plurality of blades comprising ones having an inverted V-shaped edge and ones having a straight edge wherein the former are shorter than the latter in length.

4,257,145
FOOD BALL FORMING APPARATUS
Alessio A. Bovino, P.O. Box 454, Fishkill, N.Y. 12524
Filed Dec. 13, 1978, Ser. No. 968,906
Int. Cl.³ A22C *7/00*
U.S. Cl. 17—32 **2 Claims**



1. Apparatus for forming a food such as ground meat into a ball comprising
a first cylinder member having a side port therein,
a piston within said first cylinder member having a concave face and having a first position which substantially closes one end of said first cylinder member,
the other end of said cylinder member being open,
said first cylinder member side port being positioned between said open end thereof and said concave face of said first piston when said first piston is in said first position,
means for charging a quantity of food through said side port into said first cylinder member,
a movable cylinder member arranged coaxially with said first cylinder member and having a cylinder bore equal to the cylinder bore of said first cylinder member,
said movable cylinder member having a first position against said open end of said first cylinder member so that the cylinder bore of said movable cylinder member essentially provides an extension of the cylinder bore of said first cylinder member,
a substantially fixed piston positioned within said movable cylinder member and having a concave piston face in alignment opposite to said concave face of said first piston and axially spaced away from said open end of said first cylinder member,
said first piston being operable to move from said first position by advancing through said first cylinder member and into said movable cylinder member to carry the charge of food into contact with said concave end of said fixed piston to thereby compress the food between said concave piston faces to form a ball,
said first piston then being operable to retract to said first position and
said movable cylinder member being movable by axial retraction away from the end of said first cylinder member to expose said concave piston face of said fixed piston to thereby release the food ball for removal,
a separate ejector plunger provided in the concave face of each of said pistons and operable as the pistons are separated to advance axially from the concave face of the associated piston to push the food ball away from that face for ejecting the food ball from either piston to which the food ball may adhere,
the ejector plunger in said movable piston being spring biased to the retracted position,
an actuator plunger for actuating said last mentioned ejector plunger and extending crosswise within a bore within said movable piston,
said actuating plunger being spring biased to move transversely within said movable piston against the inside surface of said cylinder members in which said movable piston is reciprocable,
said actuating plunger being released for transverse movement thereof as said movable piston is being retracted from the advanced position within said movable cylinder member and as said movable cylinder member is retracted from a position surrounding said movable piston,
said actuating plunger including a cam surface operable on the end of said associated ejector plunger to cause said ejector plunger to be extended whenever said actuating plunger is extended,
said actuating plunger being operable upon the retraction of said movable piston by engagement with the edge and inner surface of said first cylinder to retract and causing the retraction of said associated ejector plunger as well.

4,257,146
STUFFED FOOD CASING BREAK DETECTOR - SHUTOFF
Joseph G. Karp, Downers Grove, Ill., assignor to Union Carbide Corporation, New York, N.Y.
Filed Jun. 4, 1979, Ser. No. 45,318
Int. Cl.³ A22C *11/02*
U.S. Cl. 17—49 **11 Claims**



1. In food casing stuffing apparatus wherein viscous product is stuffed into a food casing length, means for controllably stopping a stuffing operation in response to a pressure drop below a preselected pressure indicative of a casing failure, comprising, in combination:
stuffing pressure detection means operably disposed to de-

tect and respond to changes of pressure within a casing being stuffed;

signal generating means operably connected to said detection means and adapted to develop sensible signals corresponding to the changes in pressure detected with said detection means;

means to communicate the signals developed by said signal generating means to control means operably connected to the stuffing apparatus; and

means to translate said signals into operative effect on said control means.

4,257,147

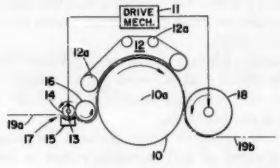
OVERLOAD CLUTCH FOR THE FEED ROLL OF A CARDING MACHINE

Alfred W. Moss, Charlotte, N.C., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Apr. 17, 1979, Ser. No. 30,777

Int. Cl.³ D01G *15/02*

U.S. Cl. 19—0.2 **11 Claims**



1. An electromagnetically actuated clutch for driving the feed roll of a carding machine, comprising:

an elongated drive shaft rotational on its longitudinal axis;

a driven clutch plate fixed to the drive shaft for torsionally driving the drive shaft;

a driving clutch plate movable toward the driven clutch plate to positively interlock with the driven clutch plate and torsionally drive the driven clutch plate;

spring-biasing means providing a biasing force for holding the driving clutch plate in spaced relation away from and out of interlocking engagement with the driven clutch plate;

an electromagnet positioned adjacent the driven clutch plate, the driven clutch plate being located between the driving clutch plate and the electromagnet, the electromagnet, when energized, electromagnetically pulling the driving clutch plate against the driven clutch plate into interlocking engagement, the driving clutch plate being movable away from the driven clutch plate against the electromagnetic force wherein the driving clutch plate rides out of engagement with the driven clutch plate at a predetermined excess torque value between the driving and driven clutch plates; and

a proximity switch positioned to sense the movement of the driving clutch plate away from and out of engagement with the driven clutch plate at the predetermined excess torque value attained while the electromagnet is energized.

4,257,148

FIBER TRANSFER METHOD

George L. Vaughn, Greer, and John D. Hollingsworth, Greenville, both of S.C., assignors to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.

Continuation of Ser. No. 824,828, Aug. 15, 1977, abandoned. This application Mar. 16, 1979, Ser. No. 21,153

Int. Cl.³ D01G *15/02, 15/46*

U.S. Cl. 19—98 **1 Claim**

1. The method of carding textile fibers including the steps of:

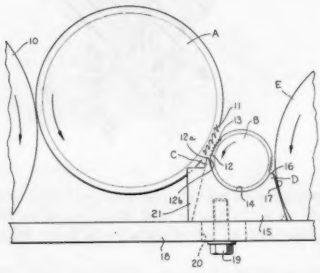
subjecting the fibers to the action of a first carding means delivering a thin carded web in open width;

providing a transfer roll;

subjecting the thin carded web to the action of said transfer roll;

providing a condensing roll adjacent said transfer roll;

subjecting said thin carded web to the action of said condenser roll forming a condensed web;



providing a doffing means;

doffing said condensed web roll;

providing a feed plate having a nose;

then passing the condensed web over the nose of said feed plate; and

then subjecting the condensed web to the action of a clothed roll immediately after the fibers pass over the nose of the feed plate.

4,257,149

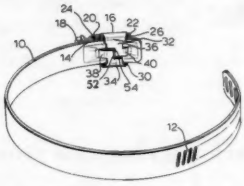
BAND CLAMP DEVICE

Ben I. Sydendal, Burlington, Canada, assignor to Tridon Limited, Burlington, Canada

Filed Dec. 7, 1978, Ser. No. 967,164

Int. Cl.³ B65D *63/00*

U.S. Cl. 24—274 R **18 Claims**



1. A band clamp device comprising:

an elongated band having transverse screw threads therein;

a U-shaped worm drive screw housing having a head end and a tail end mounted on one side of the band; and

a worm drive screw having a head end and a tail end mounted in the housing for screw-thread engagement with the said threads;

the U-shaped housing having downside and upside arms embracing respective edges of the hand, and having corresponding separate downside and upside arm ends extending parallel to the other side of the band;

the housing having only a single longitudinally-extending downside ear provided on the said separate downside arm without an adjacent longitudinally-extending upside ear on the said separate upside arm, the said single downside ear extending through a respective cooperating transverse slot in the band to retain the housing on the band; and

the housing having at least one longitudinally-extending upside ear provided on the said separate upside arm end

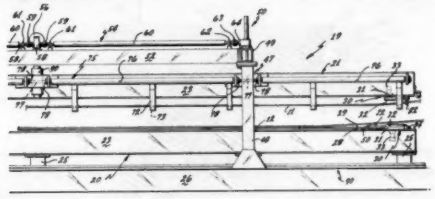
also extending through a respective cooperating transverse slot in the band, also to retain the housing on the band.

4,257,150

APPARATUS FOR ASSEMBLING WALL MODULES FROM A PAIR OF STRETCHED SHEETS OF METAL LATERALLY SPACED APART BY A SKELETAL FRAME

George R. Heffner, La Verne, and Max Casutt, San Diego, both of Calif., assignors to Grumman Flexible Corporation, Delaware, Ohio

Filed Nov. 2, 1978, Ser. No. 957,306
Int. Cl.[3] B23P *11/00*
U.S. Cl. 29—33 K 24 Claims



1. Apparatus for assembling a wall module from a plurality of stretched sheets of metal laterally spaced apart by a skeletal frame with the interior of the wall module to be later filled with structural foamed plastic comprising:

a first elongated sheet metal stretcher assembly having first sheet metal clamping means that are longitudinally fixedly mounted adjacent one of its ends and having second sheet metal clamping means mounted adjacent its other end, and means for adjustably moving said second sheet metal clamping means in the longitudinal direction,

a second elongated sheet metal stretcher assembly having first sheet metal clamping means that are longitudinally fixedly mounted adjacent one of its ends and having further sheet metal clamping means mounted adjacent its other end, and means for adjustably moving said further sheet metal clamping means in the longitudinal direction,

means for supporting said first elongated sheet metal stretcher assembly vertically above said second elongated sheet metal stretcher assembly,

means for moving one of said elongated sheet metal stretcher assemblys vertically toward or away from said other elongated sheet metal stretcher assembly, and

a plurality of longitudinally spaced skeletal frame holding arms attached to the opposite lateral sides of said first elongated sheet metal stretcher assembly.

4,257,151

INSPECTION STATION FOR BEVERAGE CONTAINERS

James C. Coots, Marietta, and Muir G. Howser, Dunwoody, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Mar. 23, 1979, Ser. No. 23,341
Int. Cl.[3] B23P *19/04*
U.S. Cl. 29—240 8 Claims

1. An apparatus for automatically tightening valves on the tops of containers as said containers pass along a conveyor into a predetermined area, said containers having index openings of a predetermined characteristic shape therein comprising:

wrench means disposed adjacent said predetermined area for tightening said valves;

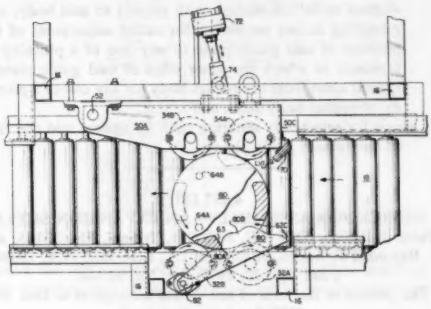
means for sensing the entrance of a container into said predetermined area and generating a signal indicative thereof;

clamp means for securing said container on a fixed axis in response to said signal;

means for rotating said container about said fixed axis;

latch means for engaging said index opening and stopping the rotation of said container when said valves are aligned with said wrench means;

means for constraining said wrench means to engage said valves;



means responsive to the engagement of said valves by said wrench means for constraining said wrench means to apply a torque to said valves; and

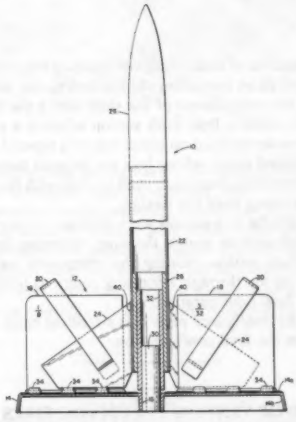
means for releasing said clamp means from said container when said valves are tightened.

4,257,152

FIN ASSEMBLY SYSTEM FOR MODEL ROCKETS

Bruce L. Paton, Colorado Springs, Colo., assignor to Centuri Engineering Co. Inc., Phoenix, Ariz.

Filed Jan. 18, 1979, Ser. No. 4,409
Int. Cl.[3] B25B *27/14*
U.S. Cl. 29—281.4 17 Claims



1. An assembly system for securing fins to a body of a model rocket comprising,

a base member having a substantially horizontal upper surface,

a plurality of guide plates in a radial array on said upper surface, each of said guide plates having a substantially planar configuration,

means generally centered on said base member for replaceably securing the body on said base member in an orientation that is substantially perpendicular to said base member, said securing means engaging said body internally and

independently of said guide plates without deforming the body,

means for replaceably mounting each said guide plate on said base member with one face of each plate structured and located to guide one of the fins in an accurately aligned radial orientation with respect to said body, said mounting means providing for radial adjustment of the position of said guide plate to any one of a plurality of positions in which the inner edge of said guide plate is spaced apart from the rocket body for any one of a plurality of rocket body sizes, and

means for selectively securing each fin against said one face of one of said guide plates.

4,257,153

DEVICE FOR ASSEMBLING AN EXPANSION SHELL

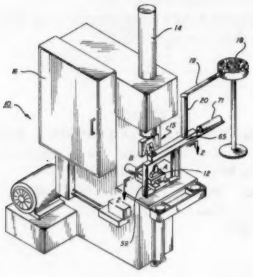
Peter J. Amico, 8275 SW. 86th Ter., Miami, Fla. 33143, and Raymond F. Amico, 98 Sargent La., Liverpool, N.Y. 13088

Filed Apr. 23, 1979, Ser. No. 32,144

The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—430 **11 Claims**



1. The method of assembling and banding together the component parts of an expansion shell including the steps of

loading the components of the shell into a die that is positioned within a first work station wherein a pair of shell sections are inclined on either side of a tapered wedge and a U-shaped strap, whose legs are secured between raised ears depending from each shell section with the base of the strap passing over the wedge,

moving the die to a second work station, coining the ears of the shell sections against the strap, returning the die to the first work station, ejecting the component parts situated upon the die through a forming gauge to bring the parts into a final configuration, and

passing the configured parts into a resilient band to hold the parts in the final configuration.

4,257,154

METHOD OF VENTING PNEUMATIC TIRES AND AN AIR GUIDE AND INSERT TOOL THEREFOR

John C. Fuller, 6615 Churchill Dr., Gladstone, Oreg. 97027

Filed Feb. 12, 1979, Ser. No. 11,508

Int. Cl.³ B23P *11/00, 19/00;* **B26F** *1/00;* **B60C** *15/00*

U.S. Cl. 29—432 **12 Claims**

1. The method of venting the bead area of a pneumatic tire, comprising:

(a) providing an elongated air guide of flexible material having an enlarged piercing head at one end, and

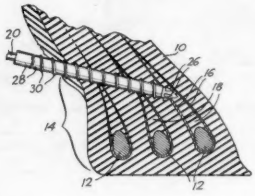
(b) inserting the air guide, enlarged head first, into the tire from the outer side adjacent the wheel flange area to be vented, the air guide extending outwardly from the head to the outer surface of the tire.

6. An air guide for venting the bead area of a pneumatic tire, comprising:

(a) an elongated flexible member having an enlarged piercing head at one end thereof,

(b) said head providing an abutment for a tool for inserting the air guide, enlarged piercing head first, into a pneumatic tire from the outer side thereof to the bead area to be vented, the elongated flexible member rearward of the enlarged piercing head being arranged to vent air from the bead area of a tire outwardly to the atmosphere.

11. A tool for inserting into the bead area of a pneumatic tire an elongated flexible air guide having an enlarged piercing head on one end thereof, the tool comprising an elongated hollow shaft arranged to receive freely therein the elongated



flexible air guide, with one end of the shaft abutting the enlarged piercing head, the shaft being arranged for insertion, with the enlarged piercing head first, into a pneumatic tire from the outer side adjacent the wheel flange area to the bead area to be vented, and then to be retracted from the tire, whereby the air guide is retained within the tire, extending from the bead area to the outer side of the tire, the end of the shaft opposite the head-abutting end being arranged for connection to a rotary drive, a screw thread on the outer surface of the shaft for screwing the shaft into a tire and unscrewing the shaft from the tire, and connector means on the head-abutting end of the shaft arranged to engage the enlarged piercing head for rotation with the shaft during screwing of the shaft into the tire and to disengage from the head during unscrewing of the shaft from the tire.

4,257,155

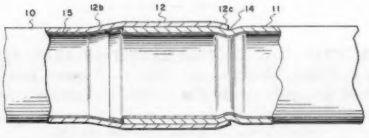
METHOD OF MAKING PIPE COUPLING JOINT

John J. Hunter, 1410 Willow Pond, Abilene, Tex. 79602

Continuation of Ser. No. 708,867, Jul. 26, 1976, abandoned. This application Aug. 9, 1978, Ser. No. 932,178

Int. Cl.³ B21D *39/00;* **B23P** *11/00*

U.S. Cl. 29—511 **8 Claims**



1. The method of mechanically interlocking a bell having a substantially uniform internal diameter over a major portion of the axial length thereof and a pin having a substantially uniform external diameter greater than said internal diameter of said bell in an interference fit pipe joint comprising the steps of:

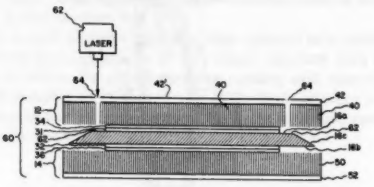
(a) forcing the end of said pin axially into said bell, whereby said bell is progressively expanded radially as the end of said pin is inserted thereinto; and

(b) deforming the mouth of said bell radially inwardly sufficiently to form an annular groove in said pin corresponding to the mouth of the bell and lock the mouth of the bell within said groove.

4,257,156
METHOD FOR THERMO-COMPRESSION DIFFUSION BONDING EACH SIDE OF A SUBSTRATELESS SEMICONDUCTOR DEVICE WAFER TO RESPECTIVE STRUCTURED COPPER STRAIN BUFFERS

Douglas E. Houston, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1979, Ser. No. 19,294
Int. Cl.[3] B23K *20/14*; H01L *21/58*
U.S. Cl. 29—580 21 Claims



1. A method for thermo-compression diffusion bonding first and second structured copper strain buffers to a substrateless semiconductor device wafer having two major opposed surfaces and an outer edge surface, said first and second structured copper strain buffers each including a bundle of substantially parallel, closely packed strands of copper of substantially equal length having one common end thereof thermo-compression diffusion bonded to a metallic sheet, said method comprising:

applying first and second metallic layers, respectively, over the first and second major opposed surfaces of said semiconductor device wafer;

applying first and second metallizations, respectively, over said first and second metallic layers;

sandwiching said semiconductor device wafer between said first and second structured copper strain buffers, the surface of each structured copper strain buffer opposite the respective metallic sheet thereof being positioned facing said wafer, said structured copper strain buffers each having a lateral extent greater than the lateral extent of said semiconductor device wafer and being so positioned as to overhang the entire outer edge surface of said semiconductor device wafer;

surrounding the so positioned semiconductor device wafer and structured copper strain buffers with an inert atmosphere;

applying a loading force to squeeze together at high pressure said so positioned semiconductor device wafer and structured copper strain buffers;

heating said so positioned semiconductor device wafer and structured copper strain buffers at a temperature within the range of 300° C. to 400° C. while said loading force is applied; and

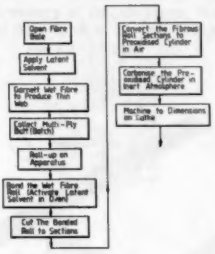
thereafter removing most of the portion of said first structured copper strain buffer not bonded to said semiconductor device wafer.

4,257,157
POROUS ELECTRICAL RESISTANCE HEATERS

James F. Pollock, Hook, England; Keith R. Linger, Sarnia, Canada, and Vincent K. Hewinson, Wyberton, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed May 23, 1978, Ser. No. 908,681
Claims priority, application United Kingdom, May 23, 1977, 21702/77
Int. Cl.[3] H05B *3/14*
U.S. Cl. 29—611 15 Claims

1. A method of manufacturing a fluid permeable electrical resistance heater element comprising the steps of forming a fluid permeable body of carbonisable fibres, applying to the fibres a latent solvent for the fibres, activating the solvent to

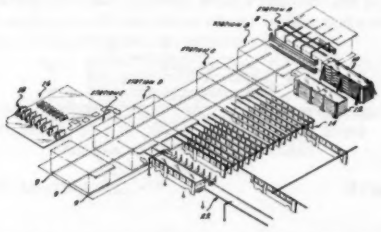

Open Fibre Bale
Apply Latent Solvent
Convert Wet Fibre to Produce Thin Web
Collect Multi-Ply Batt (Batch)
Roll-up on Apparatus
Bond the Wet Fibre Roll (Activate Latent Solvent in Bond)
Cut The Bonded Roll to Sections
Convert the Fibrous Roll Sections to Precoked Cylinder in Air
Carbonise the Pre-cooked Cylinder in Inert Atmosphere
Machine to Dimensions on Lathe

dissolve the surfaces of the fibres and thereby fuse touching fibres together, and carbonising the body of bonded fibres.

4,257,158
BUS SUSPENSION MATING FIXTURE ASSEMBLY

Max Casutt, San Diego, and George R. Heffner, La Verne, both of Calif., assignors to Grumman Flexible Corporation, Delaware, Ohio

Filed Mar. 28, 1979, Ser. No. 24,506
Int. Cl.[3] B23P *19/04*
U.S. Cl. 29—824 17 Claims



1. A bus suspension mating fixture assembly comprising:

a bus body overhead support assembly, and

a bus suspension shuttle assembly comprising a shuttle platform and means for reciprocally moving said shuttle platform laterally into position beneath said bus body overhead support assembly and back out to a loading position where a bus front suspension assembly and a bus rear suspension assembly are loaded onto said shuttle platform.

4,257,159
METHOD FOR SECURING WIRES TO SCREW TERMINALS

Louis E. Wingert, 1525 Riverdale Ave., Appleton, Wis. 54911

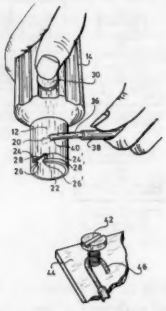
Filed Oct. 26, 1978, Ser. No. 954,860
Int. Cl.[3] H01R *43/04*
U.S. Cl. 29—861 9 Claims

1. A method for securing a wire to a screw terminal comprising the steps of:

providing a first tool having a hole of selected depth therein, the depth of said hole being defined by an end wall thereof;

inserting an end of a wire within said hole until it contacts said end wall;

rotating said wire with respect to said first tool to form an open loop in said wire;
removing said wire from said hole;

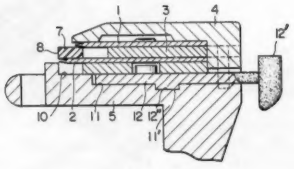


positioning said loop about a screw of a screw terminal;
closing said loop; and
tightening said screw.

4,257,160
TWO-BLADED SAFETY RAZOR

Yosiichi Murai, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Seki, Japan

Filed Jan. 9, 1980, Ser. No. 110,675
Claims priority, application Japan, Feb. 14, 1979, 54-14969
Int. Cl.[3] B26B *21/06, 21/22, 21/40*
U.S. Cl. 30—41 **5 Claims**



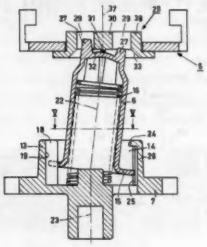
1. A two-bladed safety razor comprising: a platform connected to a handle; a shaving blade unit including an upper blade, a lower blade and a spacer member interposed between the upper and the lower blades; a blade carrier plate carrying said shaving blade unit; a cap member adapted to overlie said upper blade and fixed to said platform; an ejecting member interposed between the cutting edges of said upper and lower blades and fixed to at least one of said platform and said cap member; and means for causing a movement of said blade carrier plate to and from a fully retracted position relatively to said platform, said ejecting member being so located that the cutting edge of said lower blade is flush with or behind the front surface of said ejecting member when said blade carrier member takes said fully retracted position.

4,257,161
DRY-SHAVING APPARATUS

Hendrik A. C. Bijl, and Wijtes Bergsma, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,561
Claims priority, application Netherlands, Nov. 28, 1977, 7713044
Int. Cl.[3] B26B *19/14*
U.S. Cl. 30—43.6 **3 Claims**

1. A dry-shaving apparatus comprising a circular shear plate provided with hair-entry apertures; a circular cutting member associated with and rotatable relative to the shear plate; means to effect rotation of the cutting member; and a rotatable spindle tiltably coupled at one end to said cutting member and tiltably coupled at the other end to said rotating means, the cutting member having three coupling openings equi-spaced about its rotational axis, said one end of the rotatable spindle being provided with three axially extending coupling members equi-

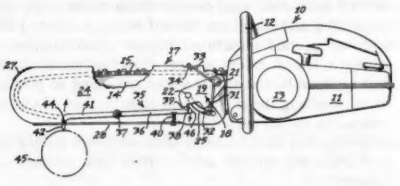


spaced about its axis of rotation for respective engagement with said coupling openings, and each coupling member having on one side a surface for engagement with a wall of the associated coupling opening and on the opposite side means cooperable with the cutting member to guide the coupling member into its respective coupling opening during assembly of the cutting member and the rotatable spindle.

4,257,162
CHAIN SAW GUARD

John T. Pardon, 985 Davidson Dr., Nashville, Tenn. 37205

Filed Apr. 27, 1979, Ser. No. 33,859
Int. Cl.[3] B27B *17/02*
U.S. Cl. 30—161 **6 Claims**



1. In a power chain saw having a frame including a forwardly extending guide bar with a longitudinal axis, top and bottom edges and a rear end portion, and a saw chain mounted on said guide bar to move along the top and bottom edges, a chain saw guard device comprising:

(a) an elongated, substantially planar shield member having top and bottom edge portions and front and rear end portions,

(b) means pivotally mounting the rear end portion of said shield member upon the frame of the chain saw for swinging movement of said shield member in its own plane proximate to and parallel to the plane of the guide bar,

(c) limit means for limiting the swinging movement of said shield member between a guard position in which the bottom edge portion of the shield member is below the chain on the lower edge of the guide bar, and an upper inoperative position,

(d) spring means interconnecting said shield member and said frame to urge said shield member toward said guard position,

(e) latch means comprising a first latch member on said frame and a second latch member on said shield member,

(f) one of said latch members being movable toward and

away from latching engagement with said other latch member,

(g) means biasing said latch members into normal latching engagement with each other in said guard position,

(h) latch release means comprising a movable trigger element cooperative with said movable latch member,

(i) means mounting said trigger element on said shield member to normally depend below the bottom edge portion of said shield member in an operative position causing said movable latch member to be in latching engagement with said other latch member when said shield member is in said guard position, and

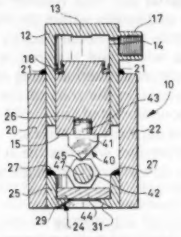
(j) said trigger element being movable upward to a release position by engagement of the trigger element with an object below the shield member causing said movable latch member to disengage said other latch member and permit said shield member to swing away from said guard position toward said upper inoperative position.

4,257,163

AUTOMOTIVE SERVICE TOOL

Wolfgang Bauer, 19 Pine Ct., Dowling, Ontario, Canada

Filed Apr. 27, 1979, Ser. No. 34,180
Int. Cl.³ B26B *17/00*; B23P *19/04*
U.S. Cl. 30—180 **19 Claims**



1. A multi-function hydraulic tool which comprises:

a hydraulic cylinder having a peripheral wall, an open end and a closed end;

a piston having outer and inner ends and slidably mounted in said cylinder for movement in an axial direction between extended and retracted positions thereof;

a port in fluid communication with the interior of said cylinder for the supply thereinto of a hydraulic fluid under pressure to cause axial outward movement of said piston through said open end of said cylinder toward said extended position thereof and for the discharge of such hydraulic fluid from within said cylinder on movement of said piston axially into said cylinder toward said retracted position thereof;

arm means secured to said cylinder and projecting axially outwardly beyond said open end thereof;

generally semi-circular annular seating means secured to said arm means in axially spaced apart position relative to said open end of said cylinder for supporting a first member when terminal pressure is applied by said piston against a cooperating second member so in turn to cause relative movement of said first and second members;

a blind bore formed axially in said piston opening at said outer end and having a smooth regular inner surface;

a thrust member adapted to be positioned at said outer end of said piston, and,

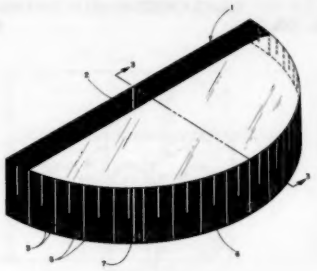
guide stud means on said thrust member having a smooth regular outer surface dimensioned to make a sliding fit in said blind bore.

4,257,164

OPTICAL PROTRACTOR

Harry L. Task, Dayton, and Ross J. Gafvert, Enon, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 9, 1978, Ser. No. 959,050
Int. Cl.³ G01B *11/26*
U.S. Cl. 33—1 N **10 Claims**



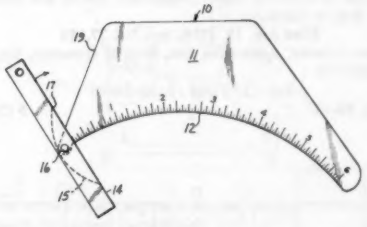
1. An optical device for visually determining the angle between a line-of-sight and the normal to an observed planar surface intersected by the line-of-sight, which is used by placing said device over the intersection and viewing a reference mark on a planar surface of the device through its scaled, curvilinear surface from the line-of-sight viewing point, comprising a solid piece of optically transparent material having a planar surface and a curvilinear surface, said curvilinear surface having rotational symmetry about a reference line on the planar surface, a scale on said curvilinear surface, and a reference mark coinciding with the reference line.

4,257,165

THUMB PITCH COMPENSATING SPAN GAUGE

John D. Ellison, 2451 W. 234 St., Torrance, Calif. 90501

Filed Jun. 13, 1979, Ser. No. 48,062
Int. Cl.³ G01B *5/02*
U.S. Cl. 33—174 F **2 Claims**



1. A span gauge for determining finger span for finger hole placement in a bowling ball comprising:

a plate, one edge of said plate being curved, the radius of curvature of said edge being approximately equal to the curvature of the ball being measured; a calibrated scale on said curved edge; pivoted pitch angle responsive means attached to one end of said curved edge whereby the pitch of a first finger hole during measurement for placement of another finger hole is automatically compensated for, said pivoted pitch angle responsive means comprising a retangular rod pivotally attached to one end of said curved edge, said rectangular rod having a longitudinal slot, the corner of said plate at the end of said curved edge being

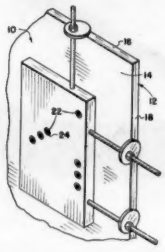
positioned within said slot; and a pivot pin passing through said rod and said corner of said plate.

4,257,166

ADJUSTABLE DRILL TEMPLATE

Gary L. Barker, and Becky S. Barker, both of Rte. 5, Box 476, Claremore, Okla. 74017

Filed Aug. 30, 1979, Ser. No. 71,401
Int. Cl.³ B23B *49/02*
U.S. Cl. 33—185 R **9 Claims**



1. An adjustable template for locating drill holes on cabinet doors and drawers comprising:

(a) a plate member having a plurality of guide bores therethrough and first and second outside edges which are mutually perpendicular;

(b) an elongated threaded rod secured to and extending outwardly from the first edge of the plate member at a right angle thereto;

(c) a pair of spaced parallel elongated rods secured to and extending outwardly from the second edge of the plate member at a right angle thereto; and

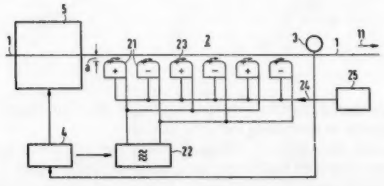
(d) edge guide means adjustably secured to each elongated rod, said edge guide means being lockable in a desired position along said rods for contacting the edges of the cabinet doors and drawers.

4,257,167

ARRANGEMENT FOR SUPPORTING A WEB, ESPECIALLY A PAPER WEB

Hans-Christian Grassman, Igelsdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 19, 1979, Ser. No. 77,110
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841371
Int. Cl.³ F26B *13/20, 23/08*
U.S. Cl. 34—1 **5 Claims**



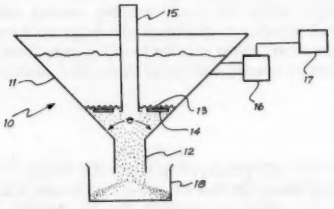
1. High frequency drying apparatus for drying and supporting a web, especially a paper web, comprising stray field electrodes adapted to be coupled to a high frequency source and which include electrically conductive nozzle chests for directing gases at the web to support the web at a predetermined distance from the stray field electrodes without contacting the stray field electrodes, said nozzle chests constituting part of the stray field electrodes and thereby also adapted to be coupled to the high frequency source.

4,257,168

METHOD OF AND APPARATUS FOR DRYING PARTICULATE MATERIAL

John Carroll; Harry Dearing; Keith Swain, and Warren Naughton, all of Mayfield, Australia, assignors to Blue Metal and Gravel Pty. Ltd., New South Wales, Australia

Filed Feb. 1, 1979, Ser. No. 8,597
Claims priority, application Australia, Feb. 7, 1978, PD3284
Int. Cl.³ F26B *7/00*
U.S. Cl. 34—17 **4 Claims**



1. A method of drying moist agglomerated particulate material utilizing a retainer having a screen, comprising:

loading the material into said retainer and supporting the material upon said screen within the retainer; and extracting moisture from the material directly from the underside of said screen while said material is supported on the screen, the moisture extraction being effected by applying heat to the material in the zone of the screen;

venting the vapour liberated from said material upwardly from a position adjacent the screen;

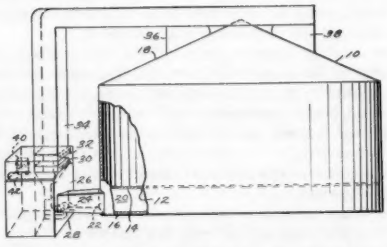
and vibrating the retainer whereby the at least partially dried material flows downwardly through said screen.

4,257,169

COMMODITY DRYER

Jack Pierce, 807 11th St., Grundy Center, Iowa 50638

Filed Dec. 11, 1978, Ser. No. 967,978
Int. Cl.³ F26B *3/04, 21/08*
U.S. Cl. 34—27 **21 Claims**



11. A commodity dryer for drying and storing commodities for extended periods comprising:

(a) at least one first heat exchanger said first heat exchanger communicating with an air inlet for removing moisture from air from an air supply communicating with said inlet;

(b) at least one second heat exchanger said second heat exchanger communicating with an air outlet said second heat exchanger providing a heating means for said air;

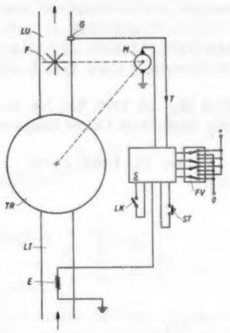
(c) means for the operation of said first heat exchanger and said second heat exchanger;

(d) control means for operating said first heat exchanger and said second heat exchanger to suppress the dew point of air in correlation to the moisture requirements of a stored

commodity, the commodity bin air temperature and ambient temperature conditions to return said air to a commodity bin at a suppressed dew point said control means operating said second heat exchanger when the temperature of said commodity bin air is at or near the freezing point of water;

(e) at least one means for transporting air from a commodity bin through said air inlet and said air outlet and back to said commodity bin.

4,257,170
TUMBLER DRYER
Barbro Gestblom; Christer Martinsson, and Hakan Treijner, all of Lidköping, Sweden, assignors to Junga Verkstader AB
Filed Oct. 17, 1979, Ser. No. 86,023
Claims priority, application Sweden, Oct. 19, 1978, 7810894
Int. Cl.³ F26B *21/10*
U.S. Cl. 34—48 **4 Claims**



1. In a tumbler dryer of the type having a container for articles to be dried, through which container hot air traverses during the drying process so that the temperature of the exhaust air from the container initially rises relatively rapidly, thereafter rises more slowly or remains constant and finally rises at an increasing rate toward the end of the drying process, the improvement comprising:

means for sensing the temperature of the hot air leaving the container; and

means responsive to said temperature sensing means for terminating the supply of hot air to the container when the temperature has risen by a predetermined amount above the temperature which existed at the time when the rate of rise of the temperature started to increase.

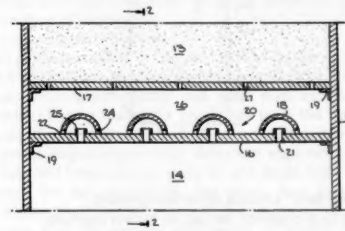
4,257,171
FLUIDIZED BED GAS DISTRIBUTOR SYSTEM
William B. Johnson, Woods Hole, and Richard C. Norton, Boston, both of Mass., assignors to Stone & Webster Engineering Corp., Boston, Mass.
Filed Jul. 16, 1979, Ser. No. 57,645
Int. Cl.³ F26B *17/00;* F27B *15/00*
U.S. Cl. 34—57 A **23 Claims**

1. An apparatus for distributing fluidization gas to a fluidized bed chamber within a fluidizing vessel, the apparatus comprising:

(a) an understructure having a plurality of holes for the passage of fluidization gas;

(b) a partition having a plurality of apertures for the passage of fluidization gas and in contact with the fluidized bed chamber, the gas being distributed evenly thereto, said partition being supported above the understructure and forming therebetween an intermediate chamber;

(c) one or more cover means to cover each hole in the understructure, which cover means are attached to the understructure within the intermediate chamber each cover means covering one or more holes in the understructure, said cover means containing openings proximate to or along the edges thereof so that fluidization gas flowing through the holes is diverted by the cover means through the openings contained therein to the intermediate chamber before entering the fluidized bed chamber via the apertures in the partition while solids filtering through the apertures in the partition when gas flow is stopped are

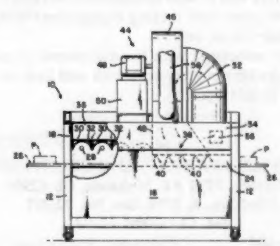


prevented from filtering through the void spaces in the understructure by the cover means, the solids accumulating in the intermediate chamber and returning to the fluidized bed chamber upon resumption of fluidization gas flow;

(d) means for attaching the cover means to the understructure, and

(e) means for supporting the partition above the understructure.

4,257,172
COMBINATION FORCED AIR AND INFRARED DRYER
Newton A. Townsend, Shelton, Wash., assignor to Olympic Infra-Dry Inc., Shelton, Wash.
Filed Jan. 22, 1979, Ser. No. 4,996
Int. Cl.³ F26B *15/18*
U.S. Cl. 34—68 **4 Claims**



1. An apparatus for drying a product to remove a vaporous substance therefrom, comprising:

an array of elongated infrared heaters having a ventilating passage extending therethrough, said heaters having their ends projecting through respective, spaced apart bulkheads to which said heaters are secured;

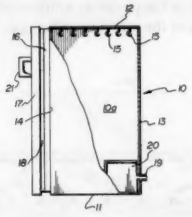
conveying means for carrying said product beneath said array; and

blower means for directing a gas through said ventilating passage onto said product thereby cooling said heaters and removing boundary layer of vapors from said product, said blower means including a pair of ducts formed by said bulkheads allowing gas to flow from a gas inlet to said ventilating passages such that the ends of said heaters project into said ducts where they are cooled by gas flowing through said ducts.

4,257,173
NO-HEAT CLOTHES DRYER

Derrick A. Smith, 1180 S. Seabreeze Blvd., Ft. Lauderdale, Fla. 33316

Filed Aug. 27, 1979, Ser. No. 70,328
Int. Cl.[3] F26B *13/30, 19/00*
U.S. Cl. 34—92 3 Claims

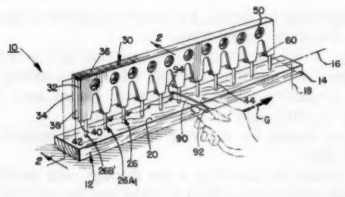


1. A "no-heat" clothes dryer comprising:
(a) a drying chamber having an access opening;
(b) an access door to said drying chamber, said door being adapted to close said access opening in an hermetically sealed chamber;
(c) means, adapted to be actuated only when said door is closed, to subject the interior of said drying chamber to a vacuum; and
(d) means positively interrelating the breaking of the vacuum with the opening of said access door, said means comprising a door handle including a lever which is pivotally mounted to move between a closed position where it locks the door in a closed position and an open position where it simultaneously opens vents to the interior of the drying chamber thereby to break said vacuum, and unlocks the door to enable opening thereof; said door handle comprising:
(i) a main framework;
(ii) an anchor plate at one corner thereof;
(iii) a release lever pivotally secured to said anchor plate;
(iv) a plunger extending through said door, and connected to the free end of said release lever normally resiliently urged to come into locking engagement with a lock on said door frame; and
(v) means associated with the movement of said plunger out of locking engagement with said lock to open vent means in said door.

4,257,174
DEVICE FOR TEACHING COUNTING

Wayman R. Presley, RFD #1, Makanda, Ill. 62958

Filed Sep. 6, 1979, Ser. No. 72,917
Int. Cl.[3] G09B *19/02*
U.S. Cl. 434—188 7 Claims

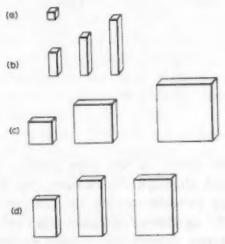


1. A device for teaching counting skills comprising:
an elongate base;
a multiplicity of spaced upright standards mounted on said base;
a housing mounted on said standards;
a plurality of counting indicia mounting means slidably mounted in said housing between adjacent standards;
counting indicia on said indicia mounting means;
a plurality of viewing means defined in said housing between adjacent standards;
each of said indicia mounting means being slidably mounted in said housing to move from a first position in which said indicia is hidden by said housing to a second position in which said indicia can be viewed via one of said viewing means;
moving means for moving said indicia mounting means from said first position to said second position, said moving means including a blade which contacts each of said standards to produce an audible click as said blade is moved across said multiplicity of standards in a glissando-like movement, each of said counting indicia corresponding to the number of clicks which will have been sounded when said blade has moved from a first standard to a standard adjacent said each counting indicia.

4,257,175
MATHEMATICAL APPARATUS

Roland A. L. Wentworth, 1 Earls Ter., London W8 6LP, England

Filed May 22, 1979, Ser. No. 41,353
Claims priority, application United Kingdom, May 23, 1978, 21521/78
Int. Cl.[3] G09B *23/04*
U.S. Cl. 434—208 4 Claims



1. Apparatus for use as an acid in teaching mathematics which apparatus is in the form of a kit comprising at least one set of rectanguloid elements, including:
(i) a plurality of cubic blocks (hereafter called "unit blocks") of the same size
(ii) a plurality of bars each having a width and thickness each equal to the length (hereafter denoted "l") of one edge of a said unit block, there being at least one such bar of each of the lengths 3l, 5l and 7l
(iii) square slabs having a thickness equal to l, there being at least one such square slab of each of the side lengths 3l, 5l and 7l
(iv) rectangular slabs having a thickness equal to l, there being at least one such rectangular slab of each of the side length combinations 3l×5l, 3l×7l and 5l×7l.

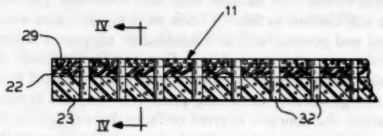
4,257,176
INSOLE WITH MATERIAL RELEASED UNDER FOOT LOADS

Donald E. Hartung, Arlington Heights, and Arnold L. Siegel, Bellwood, both of Ill., assignors to Scholl, Inc., Chicago, Ill.

Filed Mar. 9, 1979, Ser. No. 19,086
Int. Cl.[3] A43B *13/38*
U.S. Cl. 36—44 14 Claims

1. An insole for footwear comprising a multi-laminar sheet including an open cell resilient plastics material layer, a fabric layer, and a layer of resilient plastics material with relatively volatile droplets of odor treating material trapped therein by

the plastics material and progressively bleeding therefrom through the plastics material for release to the atmosphere only



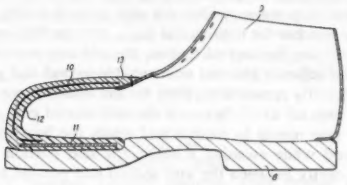
during periods of use of the insole where it is subjected to foot loads and elevated temperatures.

4,257,177

SAFETY FOOTWEAR

Lionel P. Unsted, Kettering, England, assignor to Management Operations Limited, Northamptonshire, England

Filed Dec. 21, 1978, Ser. No. 971,723
Int. Cl.³ A43C *13/14*
U.S. Cl. 36—77 R **8 Claims**



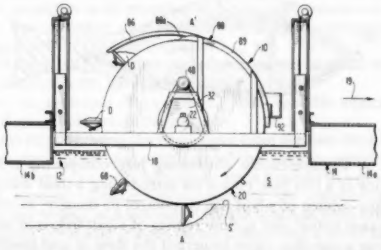
1. Safety footwear having an upper, a sole and an impact-resistant toe-portion, the said toe-portion comprising a rigid toe-cap, a toe-cap lining, an outer toe-cap cover and a flexible lip extending beyond the rear edge of the rigid toe-cap; the toe-cap lining, the outer cover and the flexible lip being formed of synthetic plastics material as a single unit to completely enclose the rigid toe-cap in a coating of the said plastics material bonded to the toe-cap; the toe-portion being attached by means of the flexible lip to the upper and the toe-portion being secured to the front of the sole.

4,257,178

HEIGHT ADJUSTABLE DRUM TYPE DREDGING APPARATUS

Shelby L. Spradlin, 424 Wolf's Neck Trail, Virginia Beach, Va. 23452

Filed Dec. 4, 1979, Ser. No. 100,075
Int. Cl.³ E02F *3/18*
U.S. Cl. 37—70 **10 Claims**



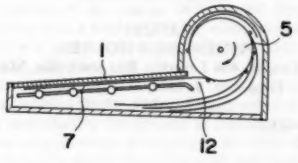
1. In a rotary drum type dredging apparatus for mounting to a floating barge or the like, said apparatus comprising:
a generally rectangular horizontal open frame,
a drum mounted within said frame for rotation horizontally about its axis with its lower end immersed within the sea,
said drum bearing radially projectable and retractable dredging blades extending longitudinally of said drum at right angles to the direction of barge and drum movement through the sea and at circumferentially spaced positions about the drum periphery, the ends of said blades being projectable from said drum periphery beneath the water to cut into an underlying sea bed to pick up dredge during drum rotation and being retractable into said drum interior after emerging from the water and to permit the dredge to be removed from the drum periphery upon full retraction of the blades,
the improvement wherein:
said drum is rotated in the direction of barge movement,
each blade bears an elongated rectangular slot intermediate of its radially inner and outer ends and being exposed during blade end projection from the drum,
a pair of oppositely directed elongated rectangular bucket plates hinged respectively along one edge thereto to the opposed longitudinal edges of said blade slots, and
means for loosely linking the other, free longitudinal edges of said bucket plates such that during drum rotation, with the ends of said blades projecting from the drum periphery and said bucket plates exposed, said bucket plates move from positions where said plates generally overlie each other to close off the slots to positions where said bucket plates are generally at right angles to each other to form an open bucket during blade contact with the sea bed for forcible pick up of excavated dredge material and to carry it forwardly in the direction of drum rotation about the periphery of the drum to a position above the level of the sea.

4,257,179

ITEM LIST SETTING MECHANISM IN AN ITEM SELECTION SIGNAL INPUT SYSTEM

Takashi Oka, Yamatokoriyama, and Hiroshi Morimoto, Sakurai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 3, 1979, Ser. No. 26,567
Claims priority, application Japan, Apr. 7, 1978, 53-41479
Int. Cl.³ B42F *17/34*; G09F *11/02*
U.S. Cl. 40—378 **12 Claims**



1. A key input system comprising:
a keyboard panel including a plurality of switches;
a plurality of item lists, each of which is provided with item markings at positions corresponding to said switches;
an item list carrying drum operatively mounted adjacent to said keyboard panel for supporting said plurality of item lists;
first drive means for rotating said item list carrying drum in a first direction, wherein said plurality of item lists are wound around said item list carrying drum;
means for selecting and locating a desired item list while said item list carrying drum is driven to rotate in said first direction by said first drive means;
second drive means for rotating said item list carrying drum in a second direction in response to completion of the selecting and locating operation, wherein one of said plurality of item lists is extracted from said item list carrying drum;

guide means for guiding said selected item list toward said keyboard panel when said item list carrying drum is driven to rotate in said second direction; and

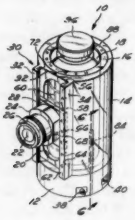
positioning means for locating said selected item list at a position corresponding to said keyboard panel, thereby registering each switch included in said keyboard panel to said selected item list.

4,257,180

MICROFICHE VIEWER

Robert A. Carpenter, Jr., Capistrano Beach, Calif., assignor to AM International, Inc., Los Angeles, Calif.

Filed Oct. 22, 1979, Ser. No. 86,740
Int. Cl.³ G02B *27/02*
U.S. Cl. 40—362 **11 Claims**



1. An apparatus for viewing a selected image frame of a microfiche, comprising:

a cylindrical outer wall;

a cylindrical inner wall coaxial within the outer wall;

a rotatable cylinder for supporting the microfiche axially within the inner wall;

selection means responsive to rotation of the cylinder for positioning a selected portion of the microfiche in a viewing aperture extending parallel to the center axis of the cylinder;

lens movable to a selected position in the viewing aperture comprising an optical path extending perpendicularly to the viewing aperture for viewing the selected image frame directly through the lens; and

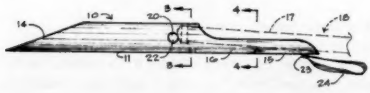
indicia on the outer wall to provide for positioning of the lens to a selected position in the viewing aperture.

4,257,181

FISHING ROD HOLDER

William A. Cooper, 804 Leverton Rd., Rockville, Md. 20852

Filed Aug. 6, 1979, Ser. No. 63,772
Int. Cl.³ A01K *97/10*
U.S. Cl. 43—21.2 **9 Claims**



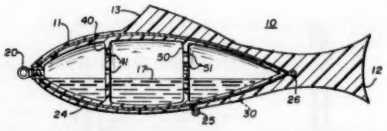
1. A fishing rod holder consisting essentially of an elongated hollow tube-like member having a longitudinally extending axis, the said tube-like member being substantially straight and including an elongated generally axially aligned annular wall, the said annular wall having generally axially aligned first and second ends and first and second end portions respectively integrally formed therewith, the said annular wall embracing the elongated annular internal cavity within the said hollow tube-like member, the said first end portion being an integral generally axially aligned outward extension from the first end of the said annular wall and being tapered outward therefrom at an angle of approximately 15°–30° to form an elongated pointed first end portion which is adapted to be inserted into particulate terrestrial material and thereby stabilize the fishing rod holder when in use, the said second end portion being an integral generally axially aligned outward extension from the second end of the said annular wall and extending outward from one side thereof to thereby form an elongated semi-annular second end portion which is adapted to support a fishing rod when in use, the tapered said first end portion and the semi-annular said second end portion extending outward from the same longitudinally extending portion of the said annular wall whereby the concave internal surfaces thereof face in the same general direction and a vertical plane passing through the longitudinal axis of the said annular wall and bisecting the tapered said first end portion to form two longitudinally and outwardly extending substantially equal portions thereof also bisects the semi-annular said second end portion to form two longitudinally and outwardly extending substantially equal portions thereof, the said semi-annular second end portion being of a size and shape to loosely receive the butt end portion of a fishing rod while awaiting a strike and having a cross-sectional configuration such that the maximum width is between the longitudinally extending side edges thereof and whereby a fishing rod resting therein may be easily and rapidly pulled outward and backward therefrom when a fish strikes without being obstructed by the said longitudinally extending side edges, and stop means within the said internal cavity of the tube-like member for limiting the depth that the butt end of a fishing rod may be inserted therein, the said stop means being positioned adjacent the said semi-annular second end portion and sufficiently remote therefrom for the resultant portion of the said internal cavity between the said second end portion and the stop means to receive and retain the butt end of a fishing rod while awaiting a strike, the said portion of the internal cavity between the said second end portion and the stop means having an internal diameter between about 1.5 and 2 inches and a depth not greater than the internal diameter thereof, the said portion of the internal cavity between the said second end portion and the stop means being substantially larger than the diameter of the butt of the fishing rod whereby the terminal end thereof rests on the stop means and against the internal side of the annular wall remote from the semi-annular second end portion while in the fishing position awaiting a strike and is forced toward the internal side of the annular wall generally opposite thereto without binding when the fishing rod is moved quickly to the strike position.

4,257,182

VARIABLE-BALLAST CHUMMING LURE

Joseph R. Thom, 1217 Johnson Ave., Point Pleasant, N.J. 08742

Filed Aug. 31, 1979, Ser. No. 71,740
Int. Cl.³ A01K *85/00, 97/02*
U.S. Cl. 43—42.06 **2 Claims**



1. A variable-ballast chumming lure comprising a hollow replica of a bait fish; means for introducing a fluid within said hollow replica of a bait fish to control its density; at least one partition within said hollow replica of a bait fish, said partition having a one-way valve to permit the flow of said fluids faster from one end to the other; a valve mounted through the lower portion of said replica of a bait fish, said valve being able to release said fluid at a given, controllable rate.

4,257,183

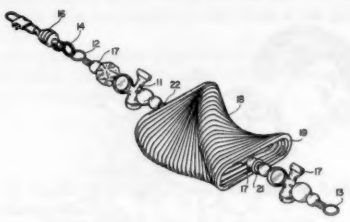
FISHING LURE

Richard A. Arms, P.O. Box 278, Sierra City, Calif. 96125

Continuation of Ser. No. 838,009, Sep. 29, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 24,220

Int. Cl.³ A01K *85/00*

U.S. Cl. 43—42.19 **4 Claims**



1. A fishing lure comprising a shaft defining an axis of rotation and at least one spinning body member with a plurality of turns of elongated pliant material coiled symmetrically about said shaft, said turns being adjacent to one another to turn a substantially solid spinning element with the ends of said coil engaging said shaft at spaced locations to occupy a predetermined portion of said shaft so that the spinning member may rotate on said shaft, said at least one spinning member being the only member carried by said shaft portion.

4,257,184

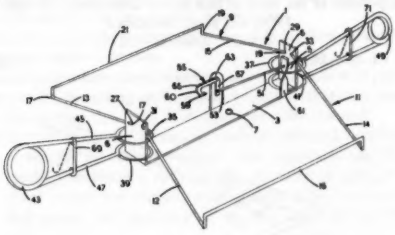
ANIMAL TRAP

Randall P. Malone, General Delivery, Gold Bridge, British Columbia, Canada (V0K 1P0)

Filed Jul. 5, 1979, Ser. No. 54,675

Int. Cl.³ A01M *23/26*

U.S. Cl. 43—92 **2 Claims**



1. An animal trap comprising:

a base member;

two jaws, each said jaw comprising two generally parallel side members with proximal ends pivotally connected to the base member, and an end member interconnecting distal ends of the side members;

a tab connected to the base member adjacent one said side member, the tab having an aperture;

two rings, each said ring extending slidably about adjacent said side members of the jaws;

resilient means biasing the rings away from the base member and towards the end members of the jaws to move the jaws from a generally horizontal, open position to a generally vertical, closed position where the end members and corresponding said side members are adjacent each other;

upwardly moveable trigger means comprising a lever having a first end and a second end, the lever being pivotally connected to the base member at a mid position between the first end and the second end, the lever having a horizontal portion between the first end and the mid position and a vertical portion between the mid position and the second end;

latch means for engaging one of the side members when the jaws are in the open position, and the rings are adjacent the base member, to maintain the jaws in the open position, the latch means comprising an elongate rod having a first end pivotally connected to the vertical portion of the lever, the aperture of the tab slidably receiving a second end of the rod, the second end of the rod projecting through the aperture and over the one side member to maintain the jaws in the open position;

means for securing bait on the horizontal portion of the lever so, when an animal tugs the bait, the first end of the lever moves upwardly and the latch means disengages from the one member, permitting the resilient means to move the jaws towards the closed position to trap the head of the animal between the jaws.

4,257,185

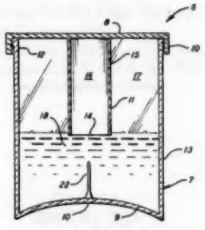
BUBBLE PRODUCING, PRESERVING AND DISPLAY APPARATUS

Steven H. Tomson, R.D. No. 4, Cazenovia, N.Y. 13035

Filed Apr. 5, 1979, Ser. No. 27,273

Int. Cl.³ B42F *13/00*

U.S. Cl. 46—6 **51 Claims**



1. An apparatus for producing, observing and preserving a bubble comprising:

(a) A casing having an upper portion and a lower portion, and

(b) bubble forming conduit means attached at one end to the upper portion of the casing, said conduit means having inlet means and a bubble forming outlet means, wherein said outlet is positioned further from said point of attachment than said inlet, and

(c) bubble forming liquid contained within the casing such that the bubble forming outlet of the conduit contacts the liquid; and wherein the amount of liquid in the casing is adjusted so that when the casing is inverted, the conduit outlet means is above the surface of said liquid, and the conduit inlet means is below the surface of said liquid so that liquid will flow from the casing and into the conduit thereby causing a bubble to form on the bubble forming conduit outlet.

4,257,186

APPARATUS FOR FLYING TOY AIRPLANE

William L. Wilson, 85 Appian Way, Arden, N.C. 28704

Filed Jul. 5, 1979, Ser. No. 54,716

Int. Cl.³ A63H *27/04*

U.S. Cl. 46—77 **6 Claims**

1. Toy airplane flying apparatus for manual manipulation, comprising:

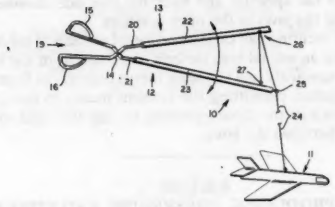
a first control member for tethering a cord leading to an aerodynamic flying object;

first means on said first control member for engagement by a hand of a person manipulating the flying object;

a second control member attached in selectably movable

relation to said first control member and having a portion operative to be located at a variable distance from said first control member in response to relative movement of said second control member;

second means on said second control member for engagement and selectable manipulation by the same hand which concurrently engages said first means; and



cord engaging means on said second portion of said second control member and operatively engaging said cord so as to change the free length of the cord extending from said first control member to said flying object, in response to said movement of said control member.

4,257,187

TOY GLIDER

John R. Waters, 9221 SE. 55th Ave., Portland, Oreg. 97206

Division of Ser. No. 728,934, Oct. 4, 1976, Pat. No. 4,122,626.
This application Oct. 2, 1978, Ser. No. 947,723
The portion of the term of this patent subsequent to Oct. 31, 1995, has been disclaimed.
Int. Cl.³ A63H *27/00*
U.S. Cl. 46—79 **3 Claims**

1. A toy glider comprising

(a) a pair of wings having inner and outer ends as well as forward and rearward ends,

(b) said forward and rearward ends comprising the terminal ends of said glider,

(c) each of said wings having an upwardly arched configuration throughout at least a rear portion thereof,

(d) the radius of curvature of said wings being reduced toward the forward end,

(e) said wings being formed of a material having sufficient rigidity to be self-substaining in said arched configuration while at rest or while in flight,

(f) and means connecting said wings together at their inner ends.

4,257,188

TOY DOLLS AND FIGURINES HAVING SURFACE PORTIONS OF REVERSIBLY CHANGEABLE COLOR

David L. Barker, Sarasota, Fla., assignor to CPG Products Corp., Minneapolis, Minn.

Filed Jan. 30, 1979, Ser. No. 7,548
Int. Cl.³ A63H *9/00, 3/24*
U.S. Cl. 46—156 **20 Claims**

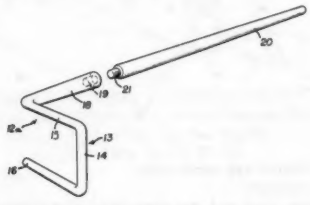
1. An animate-like figurine repeatedly capable of reversibly changing color, comprising a body having an outer surface simulating the skin of an animate being at least a portion of said surface being overlaid by an adherent layer containing microencapsulated pH-indicating material that is adapted to reversibly change color in response to changes in the hydrogen ion activity of water solutions applied thereto.

4,257,189

TOY HOOP GUIDE ROD

Richard K. Hensley, P.O. Box 151, Hazel Park, Mich. 48030

Division of Ser. No. 885,508, Mar. 13, 1978, Pat. No. 4,173,841.
This application Jun. 18, 1979, Ser. No. 49,523
The portion of the term of this patent subsequent to Nov. 13, 1996, has been disclaimed.
Int. Cl.³ A63H *33/26*
U.S. Cl. 46—241 **1 Claim**



1. A guide rod for rolling and guiding a toy hoop, comprising:

a guide member and a separate handle member;

said guide member being formed of a squared U-shaped guide portion having a base with integral legs, with a relatively short shaft having one end joined to the free end of one of the legs, so that the shaft extends outwardly of the plane of the guide portion;

said handle member being formed of an elongated rod arranged in alignment with said shaft;

and mechanical fastening means coupling the rod to the free end of the shaft including the rod end being joined to the shaft end by means of a socket formed in one end and an extension formed on the other end for fitting within said socket and releasably interconnecting the rod and shaft co-axially;

a relatively weak magnet embedded within said U-shaped

guide portion for magnetically attracting a hoop having a magnetically responsive metal liner extending along its circumference, whereby the hoop may roll relative to the magnet while tending to remain within the U-shaped guide portion;

and said guide member being formed for either left hand or right hand use by pre-forming the shaft to extend roughly perpendicularly to, but in either one direction or in an opposite direction, relative to the plane of the guide portion;

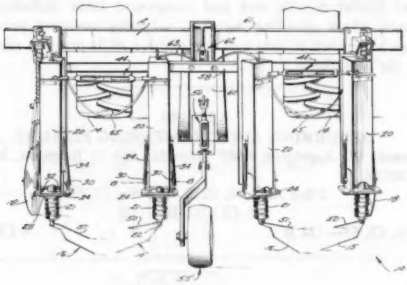
whereby a left handed or right handed guide member can be selectively coupled to the same rod for pre-selected right hand or left hand use.

4,257,190

CROP ROW CENTERING

Willis G. Dykes, Vicksburg, Miss., assignor to Lasco, Inc., Vicksburg, Miss.

Filed Oct. 12, 1979, Ser. No. 84,383
Int. Cl.³ A01M *21/04*
U.S. Cl. 47—1.3 **30 Claims**



1. Apparatus for treating crops in rows to destroy weeds in and adjacent to the crop rows, comprising

a frame mechanism adapted to move in a given direction;

first and second probes;

plant destruction means associated with each of said probes;

means for mounting each of said probes so that they extend into a crop row, and from opposite sides thereof;

first pivot means for mounting each of said probe mounting means for pivotal movement with respect to said frame mechanism about a vertical axis, the vertical axes of said pivot means horizontally spaced from each other so that said probes are mounted on opposite sides of said rows; and

means for operatively tying said probe mounting means together so that said probes will move with each other about their respective vertical axes so that said probes will engage said crops and center said plant destruction means utilizing a crop row.

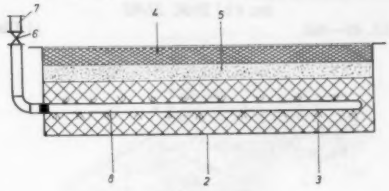
4,257,191

MOISTURE RESERVOIR FOR FERTILE SOILS FOR PLANTS

Heinz Holter, Gladbeck; Heinz Gresch, Dortmund-Derne, and Heinrich Igelbuscher, Gladbeck, all of Fed. Rep. of Germany, assignors to Industrie-Wert Beteilisungegellschaft mbH, Mainz, Fed. Rep. of Germany

Filed Jun. 19, 1979, Ser. No. 50,278
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2828488; Dec. 15, 1978, 2854131; Feb. 17, 1979, 2906141
Int. Cl.³ A01G *29/00*
U.S. Cl. 47—48.5 **3 Claims**

1. A moisture reservoir for plants comprised of a soil and water impermeable first layer, a second layer of expanded aluminum silicate on said first layer, and means in said second layer for applying moisture thereto, a third layer of a mixture



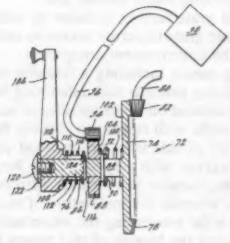
of soil and expanded aluminum silicate on said second layer, and a fourth layer of soil on said third layer.

4,257,192

WINDOW REGULATOR AND DRIVE ASSEMBLY

Donald D. Bartholomew, Marine City, Mich., assignor to Merit Plastics, Inc., East Canton, Ohio

Division of Ser. No. 877,264, Feb. 13, 1978, Pat. No. 4,182,078.
This application Feb. 5, 1979, Ser. No. 9,607
Int. Cl.³ E05F *15/00*
U.S. Cl. 49—140 **12 Claims**



1. A window regulator for operating an automobile window comprising:

a shaft;

a ring gear fixedly secured to one end of said shaft;

a drive gear slidably supported on said shaft and axially movable between first and second positions;

a handle slidably supported on said shaft adjacent another end and axially movable between first and second positions; and

drive means operative to drive said drive gear when said drive gear is in said first position;

first biasing means for urging said drive gear into said first position;

second biasing means for urging said handle into said first position;

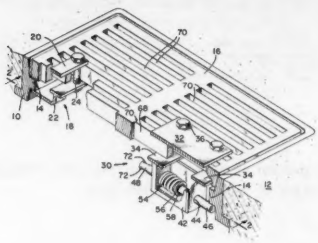
said regulator having a first operational mode in which said handle and said drive gear are in said first positions and said drive gear cooperates with said drive means to rotate said ring gear and said handle is inoperative to drive said ring gear and a second operational mode in which said drive gear and said handle are in said second position and said handle is operative to drive said ring gear and said drive gear is moved out of engagement with said drive means.

4,257,193

GRATE LOCK DEVICE

Robert C. Williams, Rte. 1, Box 343, Orting, Wash. 98360

Filed Apr. 12, 1979, Ser. No. 29,201
Int. Cl.³ E05C *21/02*
U.S. Cl. 49—465 **11 Claims**



1. An improved, vandal resistant, grate lock device of the type comprising a grate adapted to fit into a grate receiving frame means;

wherein said receiving frame means has a frame flange means extending inwardly into the opening defined by said receiving frame means;

wherein said grate lock device is of the type further comprising:

at least one mounting means carried by the grate;

a latching means carried by said mounting means; and

a means for biasing said latching means to interlock with said frame flange means when said grate is seated on said receiving frame means; and

wherein said grate further includes an unlatching hole defined by said grate to permit access to said latching means; wherein the improvement comprises:

said latching means including a latching member having a top face facing towards said unlatching hole, and a pair of side faces located on opposite sides of said latching member at an angle with respect to said top face; wherein said top and pair of side faces are inclined at an angle of less than 90 degrees with respect to the longitudinal axis of said latching member at a location adjacent to said top and side faces; wherein the inclination of said top and pair of side faces is for preventing the movement of said latching means against the biasing of said means for biasing by an unauthorized, makeshift tool; and wherein said pair of inclined side faces are adapted to be engaged by an authorized unlatching tool having a pair of working faces adapted to engage said pair of side faces.

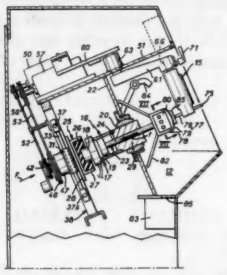
4,257,194

APPARATUS FOR MACHINING, WORKPIECES HAVING CURVED SURFACES, E.G. LENSES

Jean-Francois Cailloux, Le Raincy, France, assignor to Essilor International "Cie Generale d'Optique", Creteil, France

Filed Apr. 16, 1979, Ser. No. 30,431
Claims priority, application France, Apr. 25, 1978, 78 12190
Int. Cl.³ B24B *13/02*
U.S. Cl. 51—57 **9 Claims**

1. Apparatus for machining, polishing and or smoothing workpieces having curved surfaces, said apparatus being of the type comprising a tool holder spindle, a bearing head for maintaining a tool against a workpiece, pressure-applying means including a pneumatic piston and cylinder unit including a piston rod for establishing contact pressure between the workpiece and the tool, drive means also operatively disposed between said tool holder spindle and said bearing head for generating predetermined relative displacements between the workpiece and the tool, the improvement comprising said pneumatic piston and cylinder unit being part of said tool holder spindle and a selected one of said cylinder and said piston rod of said piston and cylinder unit being provided with a tool holder block for mounting said tool and the nonselected one of said cylinder and said piston rod being attached to said drive means, means for swivelly mounting said piston and cylinder unit, said drive means including a compound table connected



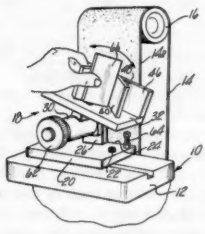
to an eccentric drive means, and means interconnecting said tool holder spindle and said compound table including an elastic block coupling member, whereby constant pressure may be applied to said tool irrespective of its position relative to the workpiece.

4,257,195

DEBURRING AND CHAMFERING FIXTURE

Donald W. Appelgren, 8647 Wayside, Apt. 9, Brighton, Mich. 48116

Filed Aug. 20, 1979, Ser. No. 67,754
Int. Cl.³ B24B *41/06*
U.S. Cl. 51—124 R **4 Claims**



1. A fixture for deburring or chamfering perpendicularly related edges of workpieces which comprises a base adapted to be fixedly mounted on the table of a sanding or grinding machine of the type having a flat abrasive element such as a belt or disc powered to travel in a plane perpendicular to the plane of the machine table, a work support table pivotally mounted on said base for rocking movement about an axis parallel to the plane of said base, said base being adapted to be mounted on said machine table so that one edge of the table is adjacent said abrasive element and said axis is perpendicular of the flat face of the abrasive element, a pair of upright guide plates fixedly mounted on said support table symmetrically on opposite sides of said axis, each of said guide plates being inclined to said axis at an angle of 45° so that the guide plates are perpendicularly related and converge toward the axis adjacent said one edge of the work support table, the inner opposed faces of said guide plates terminating adjacent said edge of the support table in slightly laterally spaced relation so that a workpiece having two perpendicularly related intersecting faces is adapted to be engaged with the guide plates such that the corner edge portion thereof defined by the intersection of said two perpendicularly related faces projects through the slot defined by the laterally spaced converging ends of the guide plates, a pair of

upright guard plates on said support table, each of said guard plates being mounted on said work support table adjacent said one edge thereof and extending laterally outwardly in opposite directions from the converging ends of the guide plates to form a protective finger pocket adjacent each guide plate, and means for adjusting said table axially along said pivotal axis to control the extent to which said corner portion of the workpiece can be advanced into the plane of the flat face of the abrasive element.

4,257,196

METHOD OF AND APPARATUS FOR GRINDING WORKPIECES BY VIBRATORY SCOURING

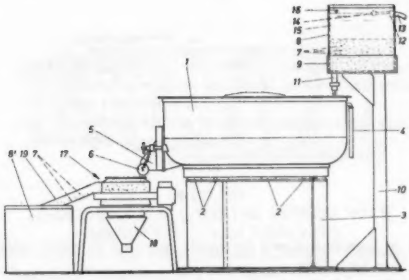
Carl K. Walther, and Hans Tolle, both of Wuppertal, Fed. Rep. of Germany, assignors to Carl Kurt Walther GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Apr. 16, 1979, Ser. No. 30,123

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1978, 2817312

Int. Cl.³ B24B *31/00*

U.S. Cl. 51—163.2 **6 Claims**



5. Apparatus for grinding workpieces by vibratory scouring in the presence of a liquid and microbodies for maintaining separation of the workpieces comprising

a vibratory scouring container

a storage container for microbodies and liquid

an inlet in the storage container for the introduction of liquid

a device for controlling the level of liquid in the storage container

a discharge opening in the bottom portion of the storage container for flushing microbodies and liquid into the vibratory scouring container

an outlet in the vibratory scouring container for removal of liquid and microbodies, and

a washing and screening means for separating the liquid and undersized microbodies from the liquid and microbodies removed from the vibratory scouring container.

4,257,197

HUB FOR MOUNTING A ROTARY TOOL

Gerard Lombard, Velaines, France, assignor to Essilor International "Cie Generale d'Optique", Cedex, France

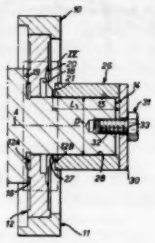
Filed Apr. 10, 1979, Ser. No. 28,881

Claims priority, application France, Apr. 11, 1978, 78 10628

Int. Cl.³ B24B *41/00*

U.S. Cl. 51—168 **19 Claims**

1. A hub for mounting a rotary tool, said hub comprising a cylindrical bore for receiving a spindle of a rotary tool wherein the spindle is of a preselected general diameter, said hub being characterized by at least three centering arms extending generally radially with respect to said bore and being uniformly angularly spaced therearound, free ends of said centering arms lying on a common circle concentric with the axis of said bore, each of said centering arms having hinge means for pivoting or flexing its respective centering arm about an axis perpendicular to the axis of said bore and tangent to another common circle concentric with said bore, said centering arms having a rest position in which the diameter of said common circle of said free end is at least as great as the diameter of said cylindrical bore and an operative position in which centering arms are



pivoted or flexed so that said common circle is radially inwardly contracted to be smaller than said cylindrical bore so as to engage said centering arms with the preselected spindle and to hold the spindle in place in said hub.

4,257,198

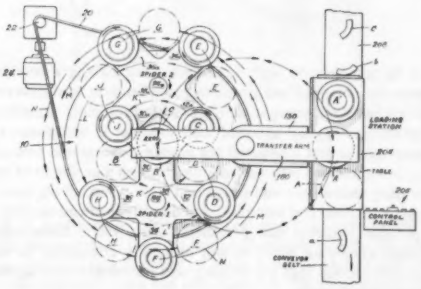
FINISHING MACHINE AND PROCESS

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Division of Ser. No. 833,583, Sep. 15, 1977, Pat. No. 4,172,339. This application Mar. 30, 1979, Ser. No. 25,386

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—313 **19 Claims**



1. A process for finishing work pieces which comprises subjecting the work pieces to the action of a finishing material in a plurality of finishing chambers while said finishing chambers are caused to gyrate about a common center and independently thereof to rotate about individual axes, whereby the work pieces and finishing material are subjected to a rotary motion impressed upon a gyratory motion, and selectively removing a gyrating finishing chamber to a work station without stopping the gyration and rotation of the other finishing chambers.

4,257,199

STADIUM COVER

Kazuo Kuboyama, Rte. 1, Box 285, Lihue, Kauai, Hi. 96766

Filed May 31, 1979, Ser. No. 44,056

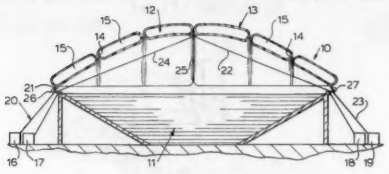
Int. Cl.³ E04B *1/345*

U.S. Cl. 52—2 **8 Claims**

1. A stadium cover, comprising:

(a) a pair of complemental canopies adapted to jointly overlie the stadium, each canopy having a plurality of compartments adapted to be filled with a lighter-than-air gas;

(b) means for pivotally supporting each of said canopies along one edge thereof at opposite sides of the stadium; and



(c) means connected to said canopies, remotely from said one edge of each canopy, for pivoting each said canopy

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4,257,200

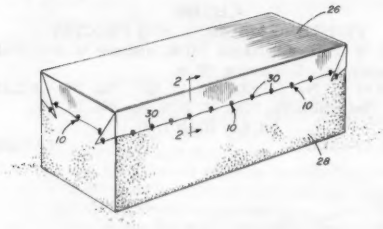
COTTON MODULE TARPAULIN PIN

Clifford A. Hensley, P.O. Box 359, Agua Dulce, Tex. 78330, and Keith G. Adams, Rte. 1, Box 150, Robstown, Tex. 78380

Filed May 21, 1979, Ser. No. 41,184

Int. Cl.[3] E04D *1/34;* **F16B** *15/00*

U.S. Cl. 52—4 **5 Claims**



1. In combination with a cotton module having a covering means for covering and protecting said module, said covering means having a peripheral edge with grommets positioned thereon and laying adjacent said module; a holddown pin comprising a first elongated leg having a sharpened free end and being inserted into said module through a grommet of said covering means near said peripheral edge, a second leg having a sharpened end and being inserted directly into said module at a position adjacent said peripheral edge, and a linear bight portion extending between and integrally connected to said first and second legs for locking said peripheral edge against said cotton module.

4,257,201

SELF-CENTERING TELESCOPING BEAMS

Christoph A. Landolt, Zurich, Switzerland, and LeRoy G. Krupke, Cottage Grove, Minn., assignors to American Hoist & Derrick Company, St. Paul, Minn.

Filed Apr. 19, 1979, Ser. No. 31,502

Int. Cl.[3] E04H *12/34*

U.S. Cl. 52—118 **7 Claims**

1. A telescopic boom assembly for supporting a load at an outward end thereof, said boom assembly being mounted to a base at an inward end thereof and including:

A. a plurality of mutually innernested, telescopically associated inward and outward boom sections;

B. each inward boom section being situated in surrounding, immediately adjacent relation to an outward boom section;

C. each such inward and outward boom sections being made up of:

(1) a pair of longitudinally extending, mutually parallel, spaced apart upper structural members of substantial strength and mass,

(2) a relatively light top web integral with and extending between said upper structural members,

(3) a pair of longitudinally extending, mutually parallel, spaced apart lower structural members of substantial strength and mass,

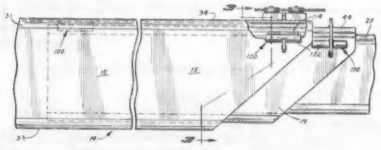
(4) a relatively light bottom web integral with and extending between said lower structural members, and

(5) a pair of relatively light, generally upright side webs each integral with a separate one of each of said upper and lower structural members;

D. forwardly mounted slide pad assemblies including slide pads on each inward boom section in position to slidingly support the upper structural members of an immediately adjacent outward boom section;

E. rearwardly mounted slide pad assemblies including slide pads on each outward boom section in position to be slidingly supported on the upper structural members of an immediately adjacent inward boom section;

F. means to move said boom sections longitudinally with respect to each other; and



G. at least one of said forwardly mounted slide pad assemblies including:

(1) a pot having a cylindrical outer surface, said pot being provided with a rectilinear slide pad receptacle bounded by side walls opening through said cylindrical surface, and by a bottom wall in normal relationship to the side walls, each side wall being mutually parallel to a single radial line extending outwardly from the cylindrical axis of said pot;

(2) a soft, free flowing elastic material covering said bottom wall of each pot receptacle and terminating short of the top of the receptacle side walls; and

(3) a slide pad of configuration to rest on said elastic material in said pot receptacle, to be in contacting relationship with all of said side walls and to terminate in a plane surface outside of said pot, said plane surface lying roughly parallel to the cylindrical axis of said pot; and

H. said slide pad being made of a flexible material which wears more readily than the immediately adjacent outward boom section which it slidingly supports.

4,257,202

ALUMINUM FRAME WINDOW WITH IMPROVED THERMAL INSULATION AND METHOD OF MAKING SAME

Alexander J. Biro, Indiana, Pa., assignor to Armcor Industries, Inc.

Filed Mar. 10, 1976, Ser. No. 666,511

Int. Cl.[3] E06B *1/32*

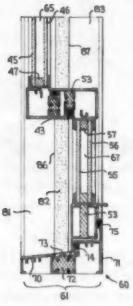
U.S. Cl. 52—204 **7 Claims**

1. An aluminum frame doublehung window comprising:

a sill structure including:

exterior and interior spaced aluminum structural members having mutually facing portions, said exterior member having an exposed flat top surface which slopes downward in an outward direction;

a rigid thermally insulative insert extending between said exterior and interior members along the top of the space therebetween and having an exposed top surface which is co-planar with the flat top surface of said exterior member;



poured and hardened thermally insulative fill material filling the space below said insert between said mutually facing portions; and

a sash member which in its closed position abuts said flat top surface of said insert.

4,257,203

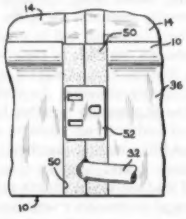
UNDER THE WALL WIRING SYSTEM WITH IMPROVED COVER MEMBERS

Robert L. Propst, Ann Arbor; Michael A. Wodka, Ypsilanti, and Thomas J. Newhouse, Grand Rapids, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Nov. 6, 1978, Ser. No. 958,192

Int. Cl.[3] **E04F** *17/08, 19/04*

U.S. Cl. 52—221 **3 Claims**



1. In a wall panel construction comprising a movable wall panel, said wall panel having ends and a bottom edge, means supporting a plurality of said wall panels in an end-to-end relationship on a supporting surface in which the bottom edge of each wall panel is located above the supporting surface to define a utility space below the bottom edges of said wall panels, said supporting means comprising a plurality of base members positioned end-to-end on said supporting surface, side cover members positioned end to end along the bottom edge of said wall panels to conceal said utility space, each of said side cover members comprising a main body having inner surface portions facing said walls and outer surface portions facing in the opposite direction, end sections formed of yieldable material affixed to the inner surface portions of said main body of each side cover member so as to extend beyond the ends of said main body, said side cover members being arranged so that the end sections of adjacent cover members are in a juxtaposed relationship with said end section on one side cover member abutting the end section on an adjacent side cover member to establish substantial continuity between adjacent side cover members, said end sections having cross sectional configurations that conform with the cross-sectional configuration of said main body to which said end sections are affixed so as to appear as integral extensions of said main body, said end sections being formed of yieldable material to enable the passage of an object between a pair of abutting end sections to and from said utility space while maintaining substantial continuity between said abutting end sections as said end sections are deformed only in the vicinity of said object, and coacting means on said base members and on said side cover members for mounting said cover members on said base members in positions to conceal said utility space.

4,257,204

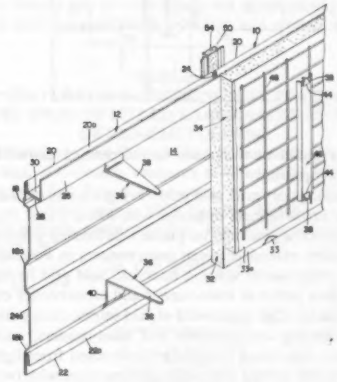
PREFABRICATED INSULATED PANEL AND WALL STRUCTURE PRODUCED THEREFROM

Martin C. Rieger, Willoughby, Ohio, assignor to Childers Products Company, Inc., Cleveland, Ohio

Filed Apr. 26, 1978, Ser. No. 900,294

Int. Cl.[3] **E04D** *1/28;* **E04C** *2/26;* **E04B** *1/80*

U.S. Cl. 52—395 **21 Claims**



1. A prefabricated insulated panel adapted to be assembled with like panels to form an insulated wall structure, the panel comprising a face member of sheet material having first and second opposed edges and side edges, the opposed edges being provided with complimentary male and female formation means extending, respectively, substantially coextensively therealong for receiving the respective complementary formation means of vertically adjacent panels when assembled therewith to couple adjacent panels together in one direction of orientation, the male formation means extending along the first edge and including a generally upstanding flange portion offset laterally from the first edge and being connected thereto by a web section, a first insulating mat extending along one surface of the face member and insulating the latter, the first mat being positioned against that surface of the face member from which the flange and web section extend, the first mat having first and second opposed edges extending, respectively, along and near the first and second edges of the face member, the second edge of the mat terminating inwardly from the second edge of the face member and being adapted to be received in a recess defined by the first edge of the face member and the associated web section and flange of the next adjacent panel when the panels are assembled, the flange being adapted for attaching the panel to an associated elongate support and for aiding in preventing heat flow through the panel at the situs of attachment of the panel to the support, a second insulating mat extending along the first mat, the second mat having first and

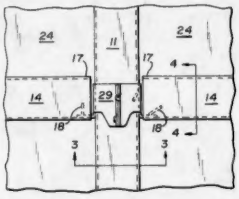
second opposed edges extending, respectively, along and near but being offset with respect to the first and second opposed edges of the first mat, the first and second insulating mats being held in place by a fastener means detachably coupled to the face member and extending through at least one of the insulating mats for holding the insulating mats in place, the fastener means being in the form of bendable prongs.

4,257,205

ATTACHMENT SYSTEM FOR SUSPENDED DRYWALL CEILING PANELS

Albert F. Kuhr, Elk Grove Village, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jul. 16, 1979, Ser. No. 57,920
Int. Cl.³ E04B *5/52, 1/40*
U.S. Cl. 52—484 **23 Claims**



1. An attachment system for suspended drywall ceiling panels comprising:

a panel support grid, said grid having a series of main-runers and cross-runners disposed with lower panel attachment surfaces in generally co-planar relationship wherein cross-runners extend between main-runners in lengths defined by main-runner spacing intervals, said grid having intersection points at main-runner and cross-runner crossings;

attachment clips positioned at said intersection points interconnecting cross-runners and main-runners, said attachment clips being integrally constructed from light-gauge steel and having a box-like configuration with two opposing vertical walls and opposing upper and lower horizontal walls wherein the upper wall centrally separates into halves along a line parallel to said main-runner, said halves include upwardly extending tabs with tab connecting means releasably connecting both halves of said upper wall, said tabs having apertures therethrough facilitating attachment to upper support means, said opposing vertical walls each having an oppositely extending cross-runner attachment flange extending from vertical edges at the same side of the clip, said attachment flanges connecting cross-runners at opposite sides of said main-runner, whereby said clip is engaged in a sleeve-like manner to said main-runner by means of said box-like configuration separating at said upper wall to extend around outer portions of the main-runner, said clip further having an alignment tongue struck out from one opposing side wall extending inwardly of said box-like configuration and a positioning slot at the side wall opposing the alignment tongue, a centrally located panel spacer key struck out from the lower wall extending downwardly in a plane generally parallel with the longitudinal axis of the main-runner; and,

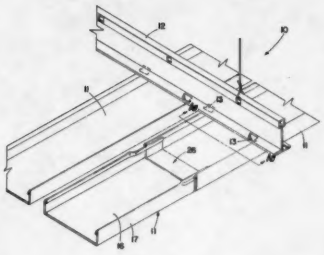
ceiling panels comprised of gypsum and being mechanically fastened to said panel attachment surfaces, wherein adjacent panels meet at butt joints along cross-runners and spaced-apart at open joints along said main-runners by said spacer keys of said attachment clips.

4,257,206

FIRE RATED CEILING

David F. Mieyal, Strongsville, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Filed Dec. 28, 1978, Ser. No. 973,852
Int. Cl.³ E04B *5/52*
U.S. Cl. 52—573 **5 Claims**



1. An elongated member for forming, with like members, the finish plane of a ceiling, wall, or other similar structure, said member being substantially straight in its longitudinal direction, said member having a generally U-shaped cross section, the U-shaped cross section being defined by a web and a pair of flanges adjacent opposite longitudinal edges of the web and extending with re-entrant portions generally at right angles of the web, tongue means at one end of said member for extending into and joining the adjacent end of a like mating member, said tongue means having means for aligning the end of its associated channel member with the adjacent end of the like mating member in a manner such that the webs of said channel and like mating members are coplanar, said aligning means being capable of aligning said member ends by restricting lateral movement therebetween in directions in a plane perpendicular to the longitudinal axis of said members, and angular movement about an axis parallel to the longitudinal axis of said members, and abutment means for determining a normal end-to-end relationship between said members, said abutment means and aligning means being constructed and arranged to cooperate to normally maintain the webs of said channel and like mating members coplanar and to produce the appearance of a butt joint between the ends of their webs and portions of the ends of their flanges, said abutment means including cam means for automatically allowing the web and flanges of the adjacent end of the like mating member to telescope with the web and flanges of said one end when an abnormal axial force is developed in said like mating member against said member, said member having on said flanges adjacent said one end and axially inward of said abutment means relief areas, said relief areas being arranged to receive re-entrant portions of flanges of said like mating member when the like mating member telescopes on said member to thereby reduce any tendency of said member to disengage upon telescoping action.

4,257,207

CONSTRUCTION SYSTEM

John M. Davis, Berlin, Mass., assignor to Cubit Corporation, Stow, Mass.

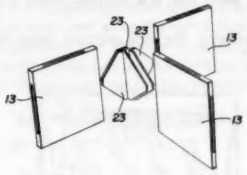
Filed Feb. 21, 1979, Ser. No. 13,086
Int. Cl.³ E04C *2/00*
U.S. Cl. 52—586 **7 Claims**

1. Construction system, comprising:

(a) a main body formed of a light weight material having a plurality of sides each of which has a triangular recess, and

(b) a connecting member having a diagonal hinge line formed by a score on each side and dividing the member into two parts, each part being a triangle that fits snugly into one of the said recesses in the main body, said member being relatively resistant to bending except along said

hinge line, the recess being twice as thick as a single connecting member, and



(c) a triangular filler having the same thickness as the connecting member adapted to lock a single triangular part of a connecting member in place in a recess.

4,257,208

ROD FOR SUPPORTING ACCUMULATED COINS IN COIN PACKAGING MACHINE

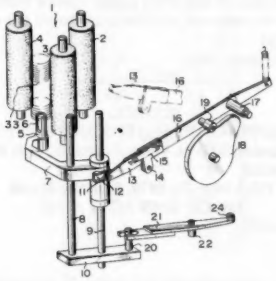
Isamu Uchida, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 859,464, Dec. 12, 1977, abandoned. This application Aug. 27, 1979, Ser. No. 70,057

Claims priority, application Japan, Dec. 17, 1976, 51-168865

Int. Cl.[3] **B65B** *11/04*

U.S. Cl. 53—212 **4 Claims**



1. A coin packaging machine for wrapping a predetermined number of vertically stacked coins, said machine comprising:

an accumulating cylinder for holding coins in columnar form;

means for wrapping paper around a column of coins, said wrapping means comprising three rollers each rotatable about a substantially vertical axis, each of the three rollers being spaced apart from the other two to define a packaging zone for the stacked coins between the three rollers;

a first rigid arm, one end of said arm being pivotable substantially horizontally about a substantially vertical axis at the other end thereof into and out of the space between two of said rollers and being vertically movable along said axis;

means to pivot said first rigid arm about said substantially vertical axis;

means to move said first rigid arm vertically along said substantially vertical axis;

a single rod for soley supporting accumulated coins from below, said rod having a single planar upper end surface on which accumulated coins can rest, said planar upper end surface engaging the lower surface of the bottom most one of the smallest diameter coins the machine can handle close to the periphery of the bottom most one of the smallest coins at a plurality of circumferentially spaced points said supporting rod guiding the accumulated coins from the accumulating cylinder to the packaging zone with the accumulated coins resting solely on the upper end surface of the rod and also supporting the accumulated coins, solely on the upper end surface, in the packaging zone during wrapping, folding, and crimping the lateral edges of the wrapping paper over the ends of the accumulated coins, said rod being fixedly secured to the upper side of the one end of said arm, being pivotable with said arm into and out of the packaging zone through the space between said two rollers and being vertically movable with said arm in the packaging zone, means defining a vertically extending groove in the rod which opens outwardly in the direction of the space between the two of said rollers;

a second rigid arm, one end of said second arm being pivotable substantially horizontally about a substantially vertical axis at the other end thereof into and out of the space between the two of said rollers and being vertically movable along said last-mentioned vertical axis;

means to pivot said second rigid arm about said last-mentioned substantially vertical axis;

means to move said second rigid arm vertically along said last-mentioned substantially vertical axis; and

a clamping claw for folding and crimping the lateral edges of the wrapping paper over the ends of column of coins supported on the upper end surface of said rod, said claw being fixedly secured to said one end of said second arm, being pivotable into and out of the groove in the rod as said second arm pivots into and out of the packaging zone and being vertically movable with said second arm.

4,257,209

APPARATUS FOR GATHERING THE FLATTENED FILLING ENDS OF FILLED LARGE SACKS BY MEANS OF ZIG-ZAG FOLDING

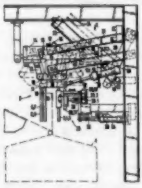
Konrad Tetenborg, and Helmut Hüwelmann, both of Lengerich, Fed. Rep. of Germany, assignors to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed May 9, 1979, Ser. No. 37,346

Claims priority, application Fed. Rep. of Germany, May 16, 1978, 2821279

Int. Cl.[3] **B65B** *7/06*

U.S. Cl. 53—371 **19 Claims**



1. Apparatus for gathering a flattened filling end of a large sack by forming zig-zag folds in the end comprising:

lateral holding means **(18)** for holding a flattened filling end of a sack in an upwardly extending position;

first carrier means **(10)** and second carrier means **(11)** positioned above the flattened filling end on opposite sides of a plane defined by the flattened filling end;

a plurality of first folding bars **(3, 4, 5)** secured to and extending downwardly from said first carrier means **(10)**;

a plurality of second folding bars **(6, 7, 8, 9)** secured to and extending downwardly from said second carrier means **(11)**;

movement means for relatively moving said first and said carrier means between spaced apart positions and positions in which said first folding bars are located in gaps between said second folding bars to thereby form zig-zag folds in the flattened filling end, and for moving said first and second carrier means between lowered positions in which lower ends of said first and second folding bars are positioned below the top of the flattened filling end and raised positions in which the lower ends are positioned

above the top of the flattened filling end, said first and said second carrier means being movable into said raised positions after formation of the zig-zag folds to thereby move said first and said second folding bars out of the folds.

4,257,210

APPARATUS FOR LATERALLY TURNING OVER THE FLATTENED FILLING END OF FILLED LARGE SACKS FOR PREPARING THE SACK CLOSURE

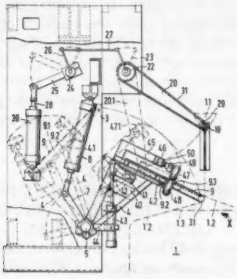
Konrad Tetenborg, and Helmut Hüwelmann, both of Lengerich of Westphalia, Fed. Rep. of Germany, assignors to Windmöller & Hölscher, Lengerich of Westphalia, Fed. Rep. of Germany

Filed May 9, 1979, Ser. No. 37,348

Claims priority, application Fed. Rep. of Germany, May 16, 1978, 2821274

Int. Cl.[3] **B65B** *7/06, 7/08*

U.S. Cl. 53—371 **11 Claims**



1. Apparatus for transferring and for laterally turning over a filling end of filled large sacks standing on horizontal supports for the purpose of preparing for closure the filling end by zig-zag folding, said apparatus comprising spreader bars for pulling apart and thereby flattening the filling end, a plate movable in an arc and having a front supporting edge extending parallel to an edge of the flattened filling end, means for moving the plate and front supporting edge into a swung-in position in which said front supporting edge is moved onto the contents of the sack in the region of a vertical medial plane parallel to the supporting edge, the plate when lowered being at an acute angle to the plane of a horizontal support for filled sacks, gripper means positioned on both sides of the plate for engaging the flattened filling end adjacent the spreader bars, said gripper means being pivotable about an axis parallel to the supporting edge for placing the filling end on the swung-in plate.

4,257,211

LAMP PACKAGING

Gene T. Fales, and Dennis V. Dollar, both of c/o Dunning Industries, Inc., P.O. Box 11393, Greensboro, N.C. 27409

Division of Ser. No. 941,574, Sep. 12, 1978, Pat. No. 4,189,051. This application May 1, 1979, Ser. No. 35,008

Int. Cl.[3] **B65B** *53/02*

U.S. Cl. 53—442 **7 Claims**

1. A method of packing a lamp, including a base and a pedestal, and a lamp shade, including a supporting spider interior thereof and in normal supporting relationship with the lampshade, in a carton including a substantially closed bottom and substantially closed sidewalls, and an originally open top closable by top flaps, utilizing first, second, and third support panels, said method comprising the steps of

placing the lamp base on the first support panel;

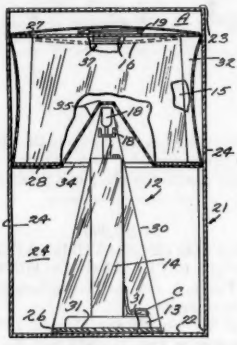
fastening the lamp and first support panel;

disposing the second and third support panels on opposite sides of the lamp shade, in abutting engagement therewith;

fastening the lamp shade and the second and third support panels together to provide a shade-panels assembly, and then sequentially;

inserting the lamp and first support panel into the carton interior;

operatively affixing the first support panel to the carton bottom;



inserting the shade-panels assembly into the carton interior and positioning it so that the interior sidewalls of the carton are operatively functionally engaged thereby, with both the second and third panels spaced from the carton top and bottom and perpendicular to all the carton sidewalls; and

closing the carton top.

4,257,212

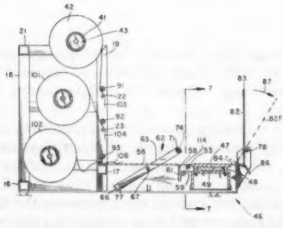
WRAPPING APPARATUS AND METHOD

Jeffrey G. Havens, 5008 N. Pennsylvania St., Apt. 16, Indianapolis, Ind. 46205

Filed May 23, 1979, Ser. No. 41,684

Int. Cl.[3] **B65B** *51/10, 67/10*

U.S. Cl. 53—463 **23 Claims**



15. A method of wrapping an item of work comprising the steps of:

pulling a strip of wrapping material forward from a supply source and over the back of a forwardly inclined support table and down in front of at least a portion of said table so that a leader portion of said strip hangs down in front of said table;

placing a work item on top of the strip on top of the back of the table, while said leader portion continues to hang in front of said table and a trailing portion of the strip extends backward under a lower edge of the work item and back to the supply source;

lifting the leader portion and turning it back and downward over the top and part of the back of the work item;

holding the leader portion against the back of the work item and tipping the work item backward and downward onto a heat table and thereupon heat sealing the leader portion

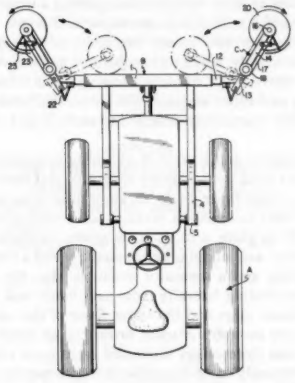
to a frontal part of said trailing portion of said strip under said back to complete a 360° wrap of the work item, and engaging a strip guidemember with the work item during the tipping step, and using the work item for depressing the guidemember and thereby depressing a part of the trailing portion which is behind the heat table onto severing means for severing the trailing portion behind the heat table.

4,257,213

IMPLEMENT APPLICABLE TO A TRACTOR FOR SUCKER REMOVAL, BUD REMOVAL AND TOPPING OF VINES

Giuseppe Brumat, Via Gorizia 3, 34070 Farra d'Isohzo (Gorizia), Italy

Filed Mar. 5, 1979, Ser. No. 17,104
Claims priority, application Italy, Mar. 3, 1978, 83338 A/78
Int. Cl.[3] A01D *50/00*
U.S. Cl. 56—12.7 **5 Claims**



1. An implement for mounting on a tractor to remove suckers and buds from the stems of vines arranged in rows and for trimming during the advance of the tractor along the ground in a direction essentially parallel to, adjacent and between said row of vines, comprising:

a frame supported on a tractor, opposing side arms on said frame arranged on opposite sides of said tractor, removable interchangeable brush treating means mounted on the outer end of each of said side arms, means on said side arms for driving said brush treating means for independent operation on both sides of said tractor, means for mounting said side arms for lateral pivotal movement and for extending said side arms outwardly to a selected distance so as to be able to approach said rows of vines to be treated either on one side or other of said tractor and at the desired height;

a hydraulic control system for raising and lowering said frame with respect to said tractor;

each of said brush treating means comprising interchangable vertical shaft rotatably driven by said driving means, a plurality of flails radially supported on said vertical shaft so as to form a vertical cylindrical rotating brush for brushing the vine stems, said plurality of flails being separated in vertical sections mounted at different heights and to act operatively at different heights on said vertical shaft;

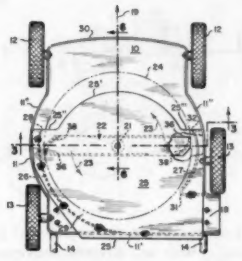
said side arms being arranged to also support a scythe bar in substitution for said brush treating means for vertical trimming of said vines in said rows.

4,257,214

CROSS FLOW ROTARY MOWER

Hugo S. Ferguson, Averill Park, and Frank E. Raymond, Grafton, both of N.Y., assignors to Duffers Associates, Inc., Poestenkill, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,197
Int. Cl.[3] A01D *35/26*
U.S. Cl. 56—13.4 **43 Claims**



1. A cross flow rotary mower which comprises

(a) a rotor mounted for rotation about a generally vertical axis and driving means therefor,

(b) said rotor during normal mowing having generally horizontal outer cutting edges and upwardly extending blower vanes spaced outwardly from the rotor axis,

(c) upper, lower and side walls for forming a conduit cooperating with said rotor to form a cross flow blower having an inlet region and an outlet region angularly spaced downstream from said inlet region,

(d) said inlet region opening in the forward direction of travel of the mower and having a lateral extent at least as great as a major portion of the tip circle diameter of the rotor during normal mowing with inward flow of air substantially throughout said inlet region,

(e) said cutting edges and blower vanes traveling within said conduit during at least substantially a semi-circle of rotation of the rotor,

(f) the extent of said lower wall being a substantial portion of the area of rotation of said rotor including substantially the semi-circle of travel of said cutting edges rearward of said inlet region and said cutting edges extending beyond said lower wall in a major portion of the forward semi-circle of travel of the cutting edges during normal mowing,

(g) said conduit including means cooperating with said rotor for producing vortex air flow on one side of the rotor axis near the region where said blower vanes pass from said outlet to said inlet regions,

(h) an extension of said upper wall extending forward substantially beyond the tip circle of said rotor and front and side skirt portions extending downwardly from said extension.

4,257,215

MOBILE CHAFF-CUTTER

Jack Maher, "Shangrilah", N. Condobolin Rd., Forbes, N.S.W., 2871, and Grosvenor F. Francis, Berowra, Leadville, Via Dunedoo, N.S.W., 2744, Australia

Filed Jun. 6, 1979, Ser. No. 45,876
Int. Cl.[3] A01D *89/00*
U.S. Cl. 56—14.4 **5 Claims**

1. A mobile chaff-production means comprising, in combination, a self-propelled wheeled vehicle having a chassis which supports:

a hay pick-up reel;

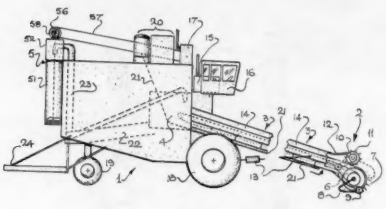
a covered conveyor;

a chaff-cutting device;

a vertically-disposed auger;

a twin-column screw bagger; and

a steam generator and associated conduits in communication with a plurality of steam inlet jets disposed in a V-shaped manifold with the apex thereof pointing downstream and positioned adjacent the input region of said covered conveyor, said manifold being mounted upon the underside of the deck of said covered conveyor, which is provided with corresponding apertures therein;



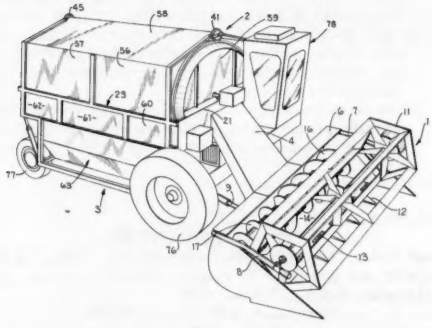
said hay pick-up reel being positioned near ground level in communication with said covered conveyor input region, the output region of which communicates with said chaff-cutting device, the downwardly-directed output of said chaff-cutting device feeding said vertically-disposed auger at its lower end, the upper end of said vertically-disposed auger, in turn, feeding said twin-column screw bagger.

4,257,216

ONION CAPSULE HARVESTER AND PROCESS

Walter M. Eiker, Jr., Twin Falls, and Douglas D. Stutzman, Buhl, both of Id., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 11, 1979, Ser. No. 29,069
Int. Cl.[3] A01D *91/02*
U.S. Cl. 56—14.6 **5 Claims**



1. In the process of harvesting onion seed, comprising the steps of:

severing the umbels from the ground-attached remainder of the onion plant;

collecting such severed umbels into a mass;

agitating said mass and thereby separating the seed-containing capsules from said umbels;

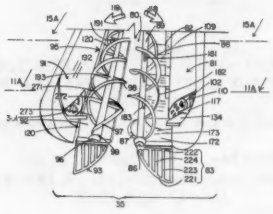
subsequently drying said capsules and separating the seeds therefrom.

4,257,217

APPARATUS AND PROCESS FOR FIELD HARVESTING OF PEPPERS

Jimmy R. McClendon, P.O. Box 345, Tulia, Tex. 79088

Filed Oct. 2, 1979, Ser. No. 81,268
Int. Cl.[3] A01D *46/00*
U.S. Cl. 56—327 R **12 Claims**



1. A traveling field harvester comprising a wheeled support frame assembly, a discharge conveyor and frame assembly, a cleaner conveyor and screen assembly, a left separator and conveyor assembly, a like right separator and conveyor assembly, and a power and control assembly, said frame assembly supporting said other assemblies thereon, said power and control assembly operatively attached to each of said other assemblies,

each separator and conveyor assembly comprising a frame, an inner rigid vertical inner wall, a slotted inner rigid floor plate, a front inner guide, an inner drag plate assembly, an inner helix assembly, a vertical outer wall, a slotted outer rigid floor plate, a front outer guide, an outer drag plate assembly, and an outer helix assembly and a longitudinally extending and a separator assembly slot, the inner floor plate extending laterally from said inner wall to an inner floor outer edge and the outer floor of the separator and conveyor assembly extends inward to an outer floor inner edge said floor edges separated from each other by said longitudinally extending separator and conveyor assembly slot,

said drag plate assemblies are located above the floor plates and the helical assemblies are located above the slot and above upwardly moving portions of the drag plate assemblies,

each respective inner and outer floor and each inner and outer wall of said separator and conveyor assembly separated by a drag unit plate slot between the bottom of the wall and the top of the edge of floor plate distant from said slot,

each drag plate assembly comprising a drag plate assembly top wheel, a bottom drag plate assembly wheel, a drag plate cable, and a series of like drag plates, each drag plate assembly top wheel near the rear of each vertical wall, a bottom drag plate assembly wheel near a front end of each vertical wall of a separator and cleaner conveyor assembly, said cable trained over said wheels, each drag plate firmly attached to clamps therefor, and the clamps firmly attached onto said cable, said guide plates located in series in one path located immediately above the floor plate and another, higher, return path located in a drag unit plate compartment on a side of each said vertical wall opposite to said slot and said drag plate assembly is operatively connected to said power and control assembly,

each helix assembly comprising a front helix journal, a first helix, a second helix and a rigid helix support shaft, a rear journal, the helixes on one side of said slot formed counterclockwise rearwardly, the helixes on the other side of the slot formed clockwise rearwardly, and said support shaft is a rigid cylindrical shaft on which are located and supported said first and second helixes, said shaft rotatably

supported in said front helix journal and on said rear journal those journals firmly attached to said floor and to said frame, the upper end of each shaft connected to a motor of said power and control assemblies,

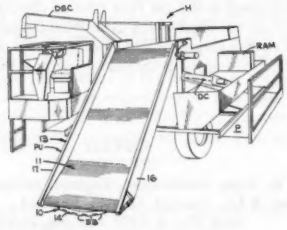
and wherein each helix assembly comprises a plurality of longitudinally spaced apart rigid transverse bar supports, connected at their inner end to the helical support shaft and at their outer end to one of said helixes and the transverse bar supports attached to said helix support shaft of the outer helix assembly all lie in the same flat plane and the transverse bar supports attached to the helical shaft of the inner helical ssemblly lie in a flat plane, the plane in which the transverse bar supports of the inner assembly lie is perpendicular to the plane in which the transverse bar supports of the outer assembly lie, and said transverse bar supports on each shaft members are all located at the same longitudinal spacing distance from each other on both helix support shafts, and the distance between the front ends of the helix support shafts of each conveyor and transport assembly is greater than the distance between the rear ends of said shafts and the lengths of the transverse bar supports are greater at the front end of the helical assemblies than at the rear end of such helical asemblies and the segments of each of said helixes is located in the surface of a frustum of a cone and the support shaft extend along the axes of said frustoconical surface and said axes are located in a forwardly and downwardly inclined horizontally extending flat plane and each helix is a rigid round-sectioned spirally wound rod.

4,257,218

HARVESTER FOR VEGETABLE CROPS SUCH AS TOMATOES OR THE LIKE

Leon R. McRobert, Ocoee, Fla., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 10, 1979, Ser. No. 101,606
Int. Cl.³ A01D *45/00*
U.S. Cl. 56—327 R **15 Claims**



1. In a harvester for vine crops, such as tomatoes, said harvester being of the type which severs crops from the ground having a main frame movable along a path, a pickup header frame pivotally attached at its rearward end to the main harvester frame, said header frame containing a pickup conveyor adapted to elevate severed vines from the ground to the harvester, an improved means for supporting the forward end of the header frame whereby the pickup conveyor is precisely maintained at a predetermined distance above the ground, comprising:

a single cutting disc rotatably attached to the header frame in a substantially horizontal position so that the disc contacts the ground and its leading edge precedes the foremost portion of the pickup conveyor as the harvester moves forward allowing the disc to sever the vines so that they may be elevated by the pickup conveyor, said disc providing the sole means of support for the front end of the header frame, and

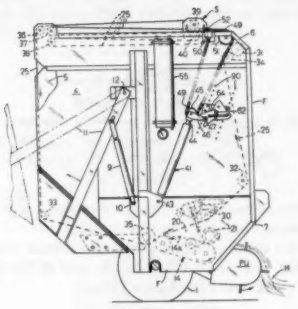
means for inducing continuous rotation in the single disc about its rotary axis.

4,257,219

CYLINDRICAL BALE FORMING MACHINE HAVING HYDRAULIC CONTROL MEANS FOR CONTROLLING THE BALE DENSITY

Donald E. Burrough; Hallis D. Campbell, and Dean E. Seefeld, all of West Bend, Wis., assignors to Gehl Company, West Bend, Wis.

Filed Aug. 27, 1979, Ser. No. 69,997
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 **13 Claims**



1. A rotary baler for forming cylindrical bales of crop material comprising, means for transporting said baler over the crop material to be baled, a pick-up mechanism for feeding the crop to the baler, cooperative means carried by the baler defining a bale forming zone for receiving and rolling crop material and in which zone a bale can grow in diameter, said cooperative means including a tensioned compacting endless member which is continuously wrapped around the growing bale to provide bale density, shiftable means mounted on said baler and connected with said compacting member whereby shifting of said means permits said compacting member to be continuously wrapped around the bale being formed, and hydraulic control means mounted on the baler and connected to said shiftable means for maintaining tension in said compacting member to insure proper bale density, said hydraulic control means including an extensible hydraulic cylinder means and a hydraulic valve means actuated by said cylinder means during an initial stage of bale formation to cause increased tension in said compacting member during the final stage of bale formation.

4,257,220

SHOCK-ISOLATING, MOVABLE MOUNTING FOR TEXTILE MACHINE SPINDLES

Carlo Menegatto, Milan, Italy, assignor to O.M.M. Officine Meccaniche Menegatto S.p.A., Milan, Italy

Filed Apr. 16, 1979, Ser. No. 30,435
Claims priority, application Italy, Apr. 19, 1978, 22462 A/78
Int. Cl.³ D01H *7/22*
U.S. Cl. 57—89 **7 Claims**

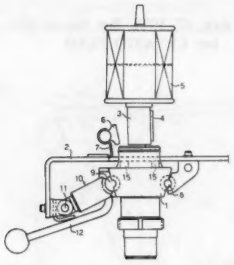
1. A shock-isolating mounting for textile machine spindles, said textile machine having a frame, said spindle having a spindle axis, said mounting comprising:

a spindle-carrying block defining a main plane thereof perpendicular to said spindle axis, and components for hinging the spindle-carrying block to the frame of the textile machine in order to turn over the spindle from an upright working position, wherein the spindle is in contact with a tangential control belt, to an inclined idle position, wherein the spindle is detached from the belt and is in contact with a braking device;

said components for hinging comprising at least a first hinging component, made of elastomeric material, which defines a fixed horizontal axis, as well as at least a second

hinging component, made of elastomeric material, which defines a horizontal axis which is mobile and parallel to the fixed horizontal axis;

a thrust component having one side hinged to one side of the



machine frame and having another side toggle-jointed to said second hinging component; and

at least one shock-isolating component, made of elastomeric material, interposed between one part of the spindle-carrying block and a fixed stop surface.

4,257,221

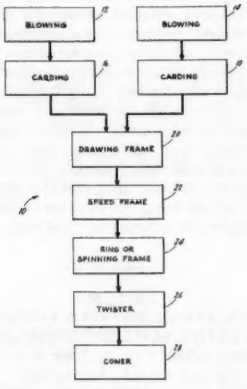
FIRE RESISTANT FIBER BLEND

Arthur L. Feinberg, R.F.D. 1, Putnam Valley, N.Y.

Continuation-in-part of Ser. No. 853,314, Nov. 21, 1977, abandoned. This application Jul. 12, 1979, Ser. No. 56,858

Int. Cl.[3] **D02G** *3/04, 3/44;* **D01G** *9/08*

U.S. Cl. 57—256 **8 Claims**



1. A method for producing a chemically untreated fire resistant blended yarn from a source of matrix fibers and a source of staple fibers, said method comprising the steps of blowing the matrix fibers to remove impurities therefrom, blowing the staple fibers in an environment isolated from said matrix fiber blowing step to remove impurities therefrom, carding the blow matrix fibers to uniformly orient same, carding the blown staple fibers in an environment isolated from that of said matrix carding step to uniformly orient same, drawing given proportions of said carded matrix fibers and said carded staple fibers together to produce a blended fiber sliver comprising from about 65 percent to about 85 percent by weight of said matrix fibers and from about 15 percent to about 35 percent by weight of said staple fibers, forming said blended fiber sliver into a rope, and spinning said rope to form a fire resistant blended yarn having an English Cotton Count not exceeding about 38/1, said spinning step being performed at a rate in the range of from about 8,000 to about 10,000 RPM to maintain a uniform cross section in said blended yarn.

4,257,222

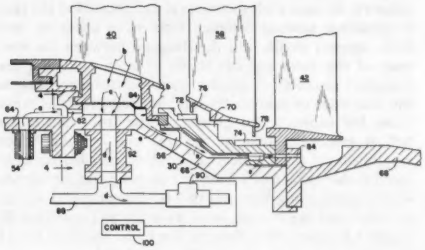
SEAL CLEARANCE CONTROL SYSTEM FOR A GAS TURBINE

Frederick M. Schwarz, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 862,748, Dec. 21, 1977, Pat. No. 4,213,296. This application Jul. 18, 1979, Ser. No. 58,591

Int. Cl.[3] **F02C** *7/26*

U.S. Cl. 60—39.02 **3 Claims**



1. A method of controlling clearance between the turbine rotor blades and blade tip seals supported from an engine casing in a gas turbine engine which produces hot combustion gases at an elevated pressure and directs the gases along a gas flow path over the rotor blades for driving the turbine, comprising the steps of: providing a heat exchanging chamber within the engine between the engine casing and the gas flow path over the blades, providing leakage paths for the hot combustion gases from the gas flow path into the heat exchanging chamber within the engine casing, and regulating the pressure in the heat exchanging chamber above and below the pressure of the hot gases in the gas flow path to control bleeding of a portion of the hot combustion gases from the gas flow path into the heat exchanging chamber during engine start-up to heat and expand the casing as thermal growth of the turbine rotor takes place.

4,257,223

ENGINES

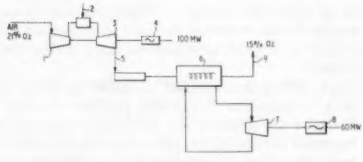
Bernard E. Enga, Maidenhead, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed May 4, 1979, Ser. No. 35,827

Claims priority, application United Kingdom, May 8, 1978, 18241/78

Int. Cl.[3] **F02C** *3/14, 6/18*

U.S. Cl. 60—39.04 **9 Claims**



1. A process for generating power comprising the following steps:

(a) compressing air and combusting said compressed air with

a fuel in a gas turbine which is drivingly connectable to an electrical power generator;

(b) removing exhaust gases produced by step (a) and adding thereto a metered quantity of fuel such that there is present in the resulting mixture a stoichiometric excess of oxygen of at least 1.5%;

(c) combusting the mixture produced in step (b) in a catalytic combustor in the form of a monolith including gas channels for the flow of reacting gases of dimensions such that the total pressure drop across the combustor is less than 10%; and

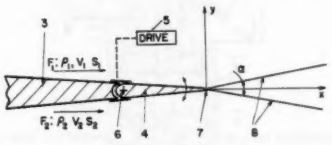
(d) using the combustor to fire a steam boiler and using the steam so produced to drive a steam turbine which is drivingly connectable to an electrical power generator.

4,257,224

METHOD AND APPARATUS FOR CONTROLLING THE MIXING OF TWO FLUIDS

Israel Wygnanski, Herzlia, Israel, and Heinrich Fiedler, Berlin, Fed. Rep. of Germany, assignors to Remot University Authority for Applied Research & Industrial Develop. Ltd., Ramat Aviv, Israel

Filed Jul. 25, 1978, Ser. No. 927,685
Claims priority, application Israel, Jul. 28, 1977, 52613
Int. Cl.³ F02K 1/26; B01F 11/00
U.S. Cl. 60—204 **21 Claims**



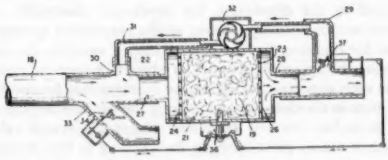
1. A method of controlling the mixing of two fluids of the same state or of substantially the same state in a mixing region having a flow axis, in which method at least one of the fluids is directed to flow into direct contact with the other fluid at the beginning of the mixing region; characterized in that an active element is driven to induce, in the vicinity of the beginning of the mixing region, oscillations of the two fluids about an axis substantially normal to said mixing region flow axis so as to produce, at the boundaries of said mixing region, small flow fluctuations substantially perpendicular to the flow axis.

4,257,225

EXHAUST GAS TREATMENT TO REDUCE PARTICULATED SOLIDS

John M. Crone, Jr., Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,705
Int. Cl.³ F01N 3/00
U.S. Cl. 60—274 **4 Claims**



1. Method for removing combustible particles from the hot exhaust gas stream having a combustion supporting ingredient therein, which includes the steps of;

passing said hot exhaust gas stream carrying combustible particle through a particle-retaining bed leaving the latter substantially free of said particles and said combustion supporting ingredient,

recycling a portion of the exhaust gas stream leaving said bed to mix with the hot particle-carrying exhaust gas at a point upstream of said bed,

forming a diluted gaseous mixture comprising a major portion of the hot exhaust gas stream, and a minor portion of said exhaust gas which is substantially free of said particles and said combustion supporting ingredient, and

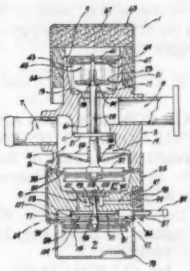
introducing said diluted gaseous mixture into said particle-retaining bed whereby to limit the rate at which retained particles are combusted.

4,257,226

BY-PASS VALVE

Leo T. Klimaszewski, Westland, Mich., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 972,876
Int. Cl.³ F02B 75/10
U.S. Cl. 60—290 **3 Claims**



1. An improved by-pass valve for use in the exhaust system of an internal combustion engine comprising a main body in which is defined an air inlet, first and second air outlets, and air flow paths between the air inlet and the respective air outlets; a first valve normally closing the air flow path between the air inlet and the first air outlet and a second valve normally opening the air flow path between the air inlet and second air outlet; a valve body member located beneath the main body, the upper and lower portions of the main body and the upper and lower portions of the valve body member being hollow; means responsive to engine vacuum for simultaneously opening the first valve and closing the closing the second valve, the vacuum responsive means including a first flexible diaphragm clamped between the main body and the valve body member whereby a first vacuum chamber exposable to engine vacuum is defined by the diaphragm and the hollow upper portion of the valve body member, a first shaft on which the first and second valves are commonly mounted, one end of the first shaft being secured to the diaphragm for movement therewith; and control means responsive to engine vacuum for exposing the first vacuum chamber to engine vacuum, the control means being responsive to abrupt changes in engine vacuum such as occur during engine decelerations for spoiling the vacuum in the first vacuum chamber and causing the vacuum responsive means to reclose the first valve and reopen the second valve, the control means reestablishing the vacuum in the first vacuum chamber after a predetermined time interval and causing the vacuum responsive means to reopen the first valve and reclose the second valve, the control means including a housing fitting over the lower end of the valve body member, a second diaphragm clamped between the housing and the valve body member to define a second vacuum chamber exposable to engine vacuum whereby one side of the second diaphragm is exposed to engine vacuum, a first passage formed in the valve body member by which the hollow lower portion of the valve

body member is exposed to engine vacuum, a bleed hole formed in the second diaphragm whereby the vacuum present on the one side of the second diaphragm is communicated to the second vacuum chamber, a second passage formed in the valve body member and extending between the upper and lower hollow portions of the valve body member whereby both the first and second vacuum chambers are simultaneously exposed to engine vacuum, a third passage formed in the valve body member and extending between the upper and lower hollow portions thereof, a second shaft movable within the third passage and having one end connected to the second diaphragm for movement therewith, an air passage formed in the valve body member and having an outlet communicating with the first vacuum chamber, a third valve mounted on one end of the second shaft for opening and closing the outlet of the air passage, a fourth valve mounted on the second shaft intermediate the ends thereof for closing one end of the first passage, and means biasing the second diaphragm to close the third valve and open the fourth valve, the second diaphragm overcoming operation of the bias means upon an abrupt change in engine vacuum to open the third valve and close the fourth valve whereby air is admitted into the first vacuum chamber to spoil the vacuum therein which results in the vacuum responsive means closing the first valve and opening the second valve thus to prevent engine backfires.

4,257,227

SECONDARY AIR CONTROLLING APPARATUS FOR INTERNAL COMBUSTION ENGINES

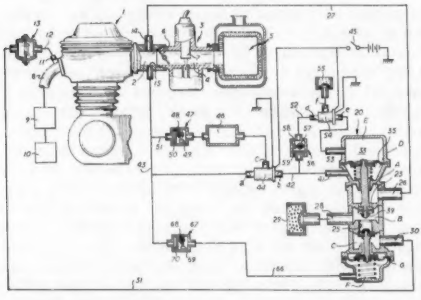
Toshihiko Sato; Yoichi Ishida, both of Saitama, and Kanau Iwashita, Sakado, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 972,733

Claims priority, application Japan, Dec. 26, 1977, 52-157116; Dec. 26, 1977, 52-175478[U]

Int. Cl.³ F02M *23/04*

U.S. Cl. 60—290 **6 Claims**



1. A secondary air controlling apparatus for an internal combustion engine, comprising:

a first chamber communicating with the downstream side of a throttle valve in an intake passage of said internal combustion engine;

a second chamber communicating with said first chamber through a first passage and with the atmosphere;

a third chamber communicating with said second chamber through a second passage and with an exhaust passage through a one-way valve which opens in response to a negative pressure part of a pulsating pressure in said exhaust passage;

valve means provided within said second chamber and moved to selectively open and close said first and second passages;

means operated by a negative pressure, and arranged between a first negative pressure chamber and a second negative pressure chamber;

said valve means being connected with said means operated by negative pressure;

said first negative pressure chamber being in communication with said intake passage downstream of said throttle valve;

said second negative pressure chamber being connected, in parallel with a main pipe line disposed between said first negative pressure chamber and said intake passage downstream of said throttle valve, through a parallelly-arranged first check valve and a first orifice; and

said valve means being moved in response to the difference in negative pressure between said first negative pressure chamber and said second negative pressure chamber.

4,257,228

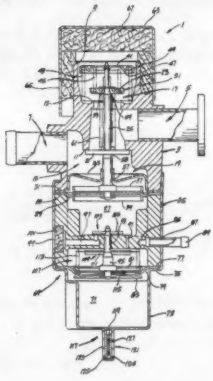
BY-PASS VALVE

Leo T. Klimaszewski, Westland, Mich., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jan. 15, 1979, Ser. No. 972,879

Int. Cl.³ F01N *3/22*

U.S. Cl. 60—290 **17 Claims**



1. In a by-pass valve for use in the exhaust system of an internal combustion engine, the by-pass valve having an air inlet, first and second air outlets, a first valve normally closing the air flow path between the air inlet and the first air outlet and a second level normally opening the air flow path between the air inlet and the second air outlet, and means responsive to engine vacuum for simultaneously opening the first valve and closing the second valve when engine vacuum reaches a predetermined level, the vacuum responsive means including means defining a chamber exposable to engine vacuum, a flexible diaphragm positioned across the chamber for one side of the diaphragm to be subjected to engine vacuum when the chamber is exposed thereto, and a shaft on which the first and second valves are commonly mounted, one end of the shaft being connected to the diaphragm for movement therewith, the improvement comprising control means responsive to engine vacuum for exposing the chamber to engine vacuum, the control means being responsive to an abrupt change in engine vacuum such as occurs during engine decelerations for spoiling the vacuum in the chamber and causing the vacuum responsive means to reclose the first valve and reopen the second valve, the control means reestablishing the vacuum in the chamber after a predetermined time interval and causing the vacuum responsive means to reopen the first valve and reclose the second valve, the controlled closing and opening of the first and second valves preventing engine backfires, and the control means including second means responsive to engine vacuum for spoiling the vacuum in the chamber so long as engine vacuum exceeds a predetermined level whereby the first valve

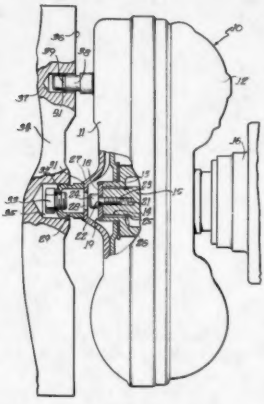
is kept closed and the second valve kept open by the first said vacuum responsive means.

4,257,229

PRELOADED TORQUE CONVERTER WITH PLUG-IN FLYWHEEL MOUNTING

Edward F. LaBuda, Sterling Heights, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 14, 1979, Ser. No. 48,336
Int. Cl.³ F16D *3/48, 33/00*
U.S. Cl. 60—330 **9 Claims**



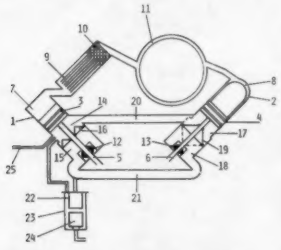
1. In a torque converter of the type having an engine driven cover and impeller and a turbine having a hub, a transmission input shaft received in said turbine hub and driven by said turbine, the improvement comprising a thrust washer loosely retained in a recessed end of the turbine hub, said input shaft having a tapped opening in the end thereof, a stop on said shaft spaced from the end, and a shaft bolt having an enlarged head adapted to abut the thrust washer and extend through said washer to threadingly engage the shaft opening.

4,257,230

HOT GAS ENGINE COMPRISING SEALING MEANS AROUND PISTON RODS

S. Gunner K. Lundholm, Mantalskroken 9, S 222 47 Lund, Sweden

Filed Dec. 21, 1978, Ser. No. 971,876
Claims priority, application United Kingdom, Dec. 31, 1977, 54403/77
Int. Cl.³ F02G *1/043*
U.S. Cl. 60—517 **5 Claims**



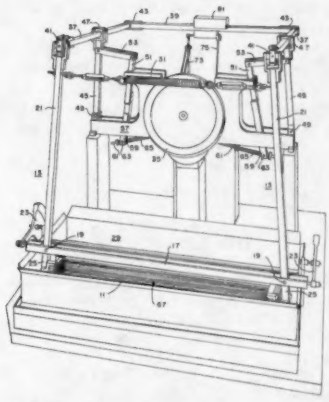
1. A multi-cylinder hot gas engine of the kind in which each cylinder contains a piston connected to a piston rod which extends through a reciprocating seal and a casing wall and is connected to a drive mechanism located in the casing in which the pressure is substantially lower than the minimum pressure in the cylinders, the piston rods being oil-lubricated in the casing and providing oil-lubrication for the reciprocating seals, characterized in that each piston rod extends through a chamber formed in part by the respective piston and the casing wall, and that a flexible partition is positioned in said chamber between the reciprocating seal and the respective piston for preventing contamination of the gas by oil leakage along said piston rod through the respective oil-lubricated reciprocating seal, said chamber being divided into a chamber upper part and a chamber lower part by said respective flexible partition.

4,257,231

HEAT ENGINE

Ridgway M. Banks, 1303 - B Stannage Ave., Berkeley, Calif. 94702

Filed Sep. 25, 1979, Ser. No. 78,836
Int. Cl.³ F03G *7/06*
U.S. Cl. 60—527 **14 Claims**



1. A heat engine comprising

a multiplicity of thermally responsive elements of a thermal memory material secured between the ends of a pair of power levers, said elements having the memory property characteristic of shortening and lengthening when thermally cycled,

means journalling each of said levers whereby as the thermally responsive elements are thermally cycled to shorten in length, the ends of the levers to which the elements are attached are drawn towards each other and the opposite or free ends of said levers separate from each other,

means connected to said levers to effect the storage of energy when said thermally responsive elements are cycled to shorten, said energy storage means effecting separation of the ends of said levers to which the thermally responsive elements are attached when the elements are thermally cycled to elongate,

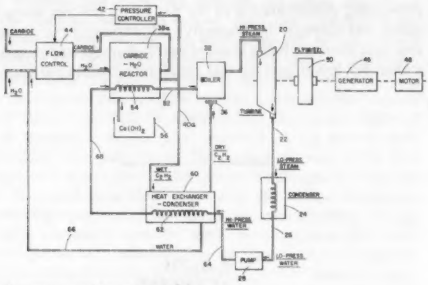
means for thermally cycling said thermally responsive elements, and

means for absorbing and translating the reciprocating motion of the levers into rotational motion.

4,257,232
CALCIUM CARBIDE POWER SYSTEM

Ealious D. Bell, 523 Palmwood Ct., San Diego, Calif. 92159

Continuation of Ser. No. 745,179, Nov. 26, 1976, abandoned.
This application Jul. 13, 1979, Ser. No. 57,438
Int. Cl.[3] F01K *13/00*
U.S. Cl. 60—676 17 Claims



1. A power system comprising;

conversion means for converting a heat rate to power;

reactor means utilizing a dry process for reacting calcium carbide and water to provide acetylene and a first source of heat;

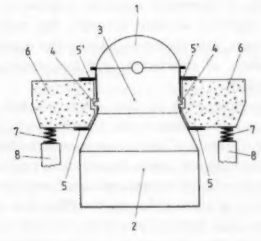
means for conveying heat from said first source of heat to said conversion means; and

means coupled to said reactor means for conveying acetylene from said reactor means to said conversion means and for burning the acetylene to provide a second source of heat for said conversion means, said means for conveying heat from said first source of heat to said conversion means being a means for conveying heat at rates dependent upon the rate of the reaction in said reactor means, whereby the temperature of said reactor means will tend to be self-regulating.

4,257,233
FASTENING ARRANGEMENT ESPECIALLY FOR A TURBINE AND A CONDENSER

Gunter Kaelber, Birmenstorf, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Mar. 21, 1979, Ser. No. 22,628
Claims priority, application Switzerland, Mar. 21, 1978, 3059/78
Int. Cl.[3] F01D *25/28;* F01K *11/02*
U.S. Cl. 60—687 12 Claims



1. A fastening arrangement especially for a turbine and a condenser connected to an exhaust of the turbine, comprising:

a foundation table;

first means for fastening the turbine to the foundation table;

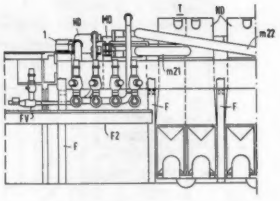
second means for fastening the condenser to the foundation table; and

resilient means for resiliently mounting the foundation table on a support structure.

4,257,234
VALVE ARRANGEMENT FOR TURBOSETS

Werner Trassl; Gerhard Purr, and Helmut Scheffczyk, all of Mülheim, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Apr. 13, 1979, Ser. No. 29,743
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 2816598
Int. Cl.[3] F01B *21/04*
U.S. Cl. 60—719 13 Claims

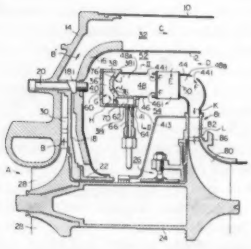


1. In a turboset having a high-pressure turbine stage and at least another turbine stage mounted on foundation supports and largely disposed above a machine floor, the high-pressure turbine stage being connectible to main steam lines, a valve arrangement comprising emergency-stop main-steam governing valves through which the high-pressure turbine stage is connectible to the main steam lines, said emergency-stop main-steam governing valves being disposed forward of the head of the high-pressure turbine stage and below the machine floor, and including an upper foundation ceiling disposed approximately at the level of the machine floor and formed with beams from which said emergency-stop main-steam governing valves are thermally displaceably suspended.

4,257,235
GAS TURBINE ENGINE WITH FUEL-AIR PREMIX CHAMBER

Teru Morishita, and Manabu Kazaoka, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 798,987, May 20, 1977. This application Nov. 27, 1978, Ser. No. 964,051
Claims priority, application Japan, Mar. 14, 1977, 52/26967
Int. Cl.[3] F02C *7/22*
U.S. Cl. 60—736 3 Claims



1. A gas turbine comprising:

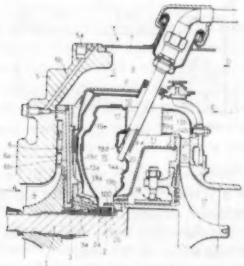
a housing assembly;

a shaft rotatably supported by the housing assembly;
a set of compressor blades fixed to the shaft, said housing assembly forming an outer air passageway of annular shape adapted for receiving a flow of air from the compressor blades and an inner air passageway of annular shape adapted for receiving the flow of air from the outer air passageway;
a set of turbine blades fixed to the shaft in the housing assembly so that the turbine blades are spaced apart from the compressor blades;
tube means for forming a combustion chamber inside the housing assembly, said combustion chamber, on a downstream side thereof, facing the turbine blades so that flow of combustion gas is directed toward the turbine blades to rotate the shaft;
a mixing chamber of annular shape in the inner air passage on an upstream side of the annular combustion chamber, said mixing chamber having a row of circumferentially arranged air intake holes through which air in the inner air passageway is introduced into the mixing chamber;
an annular wall between said mixing chamber and said combustion chamber; and
means for introducing evaporative fuel into the mixing chamber for permitting the evaporative fuel to be mixed with the air in the mixing chamber to form a combustible mixture, the wall between said mixing chamber and said combustion chamber having a plurality of circumferentially spaced injection nozzle sets comprising an annular row of circumferentially spaced injection nozzles adapted for ejecting a combustible mixture in the mixing chamber into the combustion chamber, each of said nozzle sets being comprised of annularly successive pairs of next adjacent ones of said injection nozzles having axes which are inclined with respect to each other in such a manner that the axes intersect with each other at a position within the annular combustion chamber, whereby a violent contact of flows of a combustible mixture ejected from each set of the injection nozzles occurs in said combustion chamber, causing a strong turbulence of flow to be generated in the combustion chamber.

4,257,236
LIQUID ATOMIZING DEVICE

Teru Morishita, Shizuoka, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 16, 1979, Ser. No. 21,248
Claims priority, application Japan, Oct. 30, 1978, 53-149191[U]
Int. Cl.³ F02C 7/22
U.S. Cl. 60—745 **8 Claims**

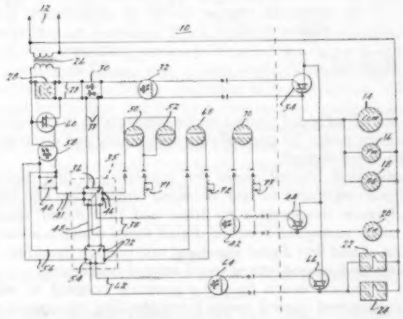


1. A liquid atomizing device comprising:
a nozzle emitting the liquid to be atomized; and
a hollow cylindrical atomizing member adapted at one end for attachment to a rotary shaft coaxially therewith for rotation about its own axis, said atomizing member having a cylindrical inner surface coaxially encircling said rotary shaft;
said nozzle having an outlet having an axis directed substantially at right angles to said inner surface;
said atomizing member being provided at another end thereof, which is open and defines an outlet for said atomizing member, with a plurality of arcuate rims radially inwardly projecting from said other end of said atomizing member, said rims being circumferentially equally spaced apart from one another to define an arcuate recess between each adjoining pair of said rims, said recesses defining paths on said cylindrical inner surface for a spray of said liquid leaving said inner surface centrifugally during the rotation of said atomizing member.

4,257,237
ELECTRICAL CONTROL CIRCUIT FOR ICE MAKING MACHINE

Walter H. Hoenisch, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Prospect Heights, Ill.

Filed May 15, 1979, Ser. No. 39,390
Int. Cl.³ F25C 1/00
U.S. Cl. 62—157 **19 Claims**



1. In an ice making machine having an ice forming mold for receiving water to be frozen therein, a refrigeration system, and a control circuit for controlling the operation of said refrigeration system so as to cause water to freeze in said forms during a freezing cycle and to effect release of ice from said forms during a harvest cycle; the improvement wherein said control circuit comprises:
first temperature responsive means having an electrical characteristic that varies according to temperature and being disposed so as to indicate ambient temperature; and
timing circuit means responsive to said first temperature responsive means for controlling the time period of said freeze cycle by varying said time period in accordance with variations in said electrical characteristic of said first temperature responsive means.

4,257,238
MICROCOMPUTER CONTROL FOR AN INVERTER-DRIVEN HEAT PUMP

Kenneth J. Kountz, Hoffman Estates, Ill.; Kenneth W. Cooper, York, Pa.; Frederic H. Abendschein, Columbia, Pa., and Lee E. Sumner, Jr., Dallastown, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 28, 1979, Ser. No. 80,363
Int. Cl.³ F25D 17/04; F25B 1/00
U.S. Cl. 62—176 B **9 Claims**

1. A refrigeration system for conditioning a space and having a closed refrigerant circuit including a compressor, a condenser, an expansion device, and an evaporator connected respectively in series, said system comprising:
first sensing means for measuring the actual temperature of a

space to be conditioned and generating an electrical signal representative of the measured temperature;

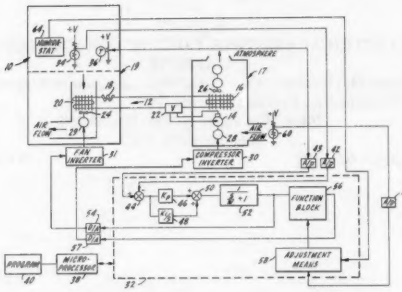
means for setting a reference temperature of the space to be conditioned and generating a second electrical signal representative of the reference temperature;

second sensing means for measuring the relative humidity and generating a third electrical signal representative of the reference temperature;

evaporator fan motor for driving a fan to direct air into the conditioned space;

first motor speed control means connectable to said evaporator fan motor for controlling continuously and discretely the speed thereof:

compressor motor for driving the compressor;



second motor speed control means connectable to said compressor motor for controlling continuously and discretely the speed thereof;

programmed control means for generating a first digital signal responsive to said measured temperature and said reference temperature to drive said first motor speed control means and a second digital signal which is a function of said first digital signal and said relative humidity to drive said second motor speed control means; and

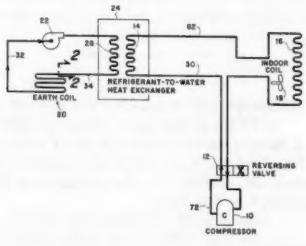
data processor means having a program coupled to said programmed control means for controlling the operation thereof to affect a measured temperature and relative humidity of the conditioned space.

4,257,239

EARTH COIL HEATING AND COOLING SYSTEM

James R. Partin, 3623 N. Park Dr.; James E. Bose, 524 E. Tyler Ave., and Carl W. Ledbetter, 323 E. Airport, all of Stillwater, Okla. 74074

Filed Jan. 5, 1979, Ser. No. 1,078
Int. Cl.³ F25B *27/02;* F25D *23/12;* F25B *13/00*
U.S. Cl. 62—238.7 **6 Claims**



1. A heating and air conditioning system for a structure, comprising:

a compressor;

a first evaporator-condenser;

a second evaporator-condenser located within the structure including blower means for distributing heated or cooled air;

a reversing valve in series with said compressor and said first and second evaporator-condensers whereby in one mode of the valve the first evaporator-condenser functions as an evaporator and the second evaporator-condenser functions as a condenser, and in the other mode the functions are reversed;

a refrigerant-to-water heat exchanger embodying said first evaporator-condenser and having a water passageway;

an elongated earth coil conduit having the major portion laid out in a pattern forming an earth coil field wherein the earth coil is buried at a generally horizontal and uniform depth below frost line, the earth coil conduit being connected in series with said water passageway, forming a closed water-to-earth heat transfer system;

a pump in series with said heat exchanger, water passageway and said conduit for circulating water therethrough in a closed system;

means positioned in the earth adjacent to said earth coil to maintain the earth in wet condition around said earth coil whereby heat is transferred between said heat pump refrigerant and the water and from the water to the earth;

a cooling mode flow control valve in series with said refrigerant-to-water heat exchanger water passageway;

means of detecting the pressure of refrigerant entering said refrigerant-to-water heat exchanger; and

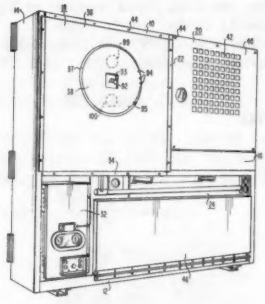
means to control said cooling mode flow control valve in response to the pressure of refrigerant to open said cooling mode flow control valve in response to rising refrigerant pressure.

4,257,240

CONTAINER REFRIGERATION UNIT

David A. Christiansen, Bloomington; Kevin W. Kiefer, Eden Prairie; Lowell B. Naley, Minnetonka; Ronald W. Seipp, Apple Valley; Lawrence J. Shirek, Minneapolis, and Robert L. Harrington, Eden Prairie, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Sep. 26, 1979, Ser. No. 79,014
Int. Cl.³ F25D *19/02, 15/00;* B60H *3/04;* F25D *23/00*
U.S. Cl. 62—448 **7 Claims**



1. A transport refrigeration unit adapted to be mounted on the front wall of a transport container for conditioning the interior of the container, comprising:

a generally rectangular outer frame forming the top, bottom and opposite side walls of the unit;

intermediately-located, vertically-disposed partition means separating the upper portion of said frame into side-by-side evaporator and condenser compartments;

partition means defining the bottom of said evaporator compartment;

a power compartment below said evaporator and condenser compartments and extending for the width of said unit,

said power compartment containing a power package including an internal combustion engine, an electric motor-alternator and a refrigerant compressor in in-line relation, said power compartment being in substantially open communication with the bottom of said condenser compartment;

a radiator coil and a refrigerant condenser coil in said condenser compartment;

a refrigerant evaporator coil in said evaporator compartment, a material portion of said coil being forward of the plane of the rear face of the frame and the remaining portion projecting out of the plane of the rear face of the frame;

evaporator fan means in the upper part of said evaporator compartment for moving air to be conditioned into said evaporator compartment from said container interior, through said evaporator coil and back into said container interior;

condenser fan means in said condenser compartment for creating a flow of air from atmosphere through said condenser and radiator coils, into the power compartment, and back to atmosphere;

panel means covering the front face of said evaporator and condenser compartments, said panel means including a condenser air inlet for said condenser compartment; and

thermal insulation insulating the front face of said evaporator compartment.

4,257,241

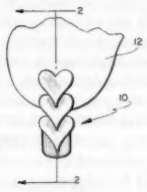
EARRING CONSTRUCTION

Joseph B. Voccio, 10 Fern Dr., Rumford, R.I. 02916, and Paul A. Voccio, 303 Newman Ave., Seekonk, Mass. 02771

Filed Sep. 24, 1979, Ser. No. 78,392

Int. Cl.³ A63H *7/00*

U.S. Cl. 63—14 D **7 Claims**



1. An earring having a body including an outer ornamental face and means for resiliently clamping said body on the lobe of the wearer's ear with said outer face in view, said body having first and second longitudinally spaced ends and an intermediate main body portion, at least said first end inwardly offset from said main body portion to define a concave inner body surface, said clamping means being a generally straight, longitudinally directed coil spring of a single directional run attached at one end thereof to said body first end and extending over said inner body surface to define a lobe receiving pocket area by generally bridging said body ends said spring other end positioned adjacent said second body end to define a narrowed entrance to said pocket, and spring adapted to be flexed away from said body inner surface in a plurality of directions relative thereto to accommodate various sized ear lobes while continuously resiliently being urged to its normal bridging position, said spring other end terminating in an enlarged head having an arcuate surface disposed in opposition to said second body end.

4,257,242

RESILIENT COUPLINGS

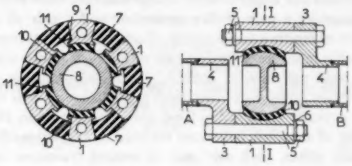
Michel Domer, Montigny les Cormeilles, France, and Eberhard Kriese, Cologne, Fed. Rep. of Germany, assignors to Hutchinson-MAPA, Paris, France

Filed Feb. 13, 1979, Ser. No. 11,906

Claims priority, application France, Mar. 10, 1978, 78 07035

Int. Cl.³ F16D *3/64*

U.S. Cl. 64—14 **7 Claims**



1. A resilient coupling to be placed between two shafts or other members to be driven one by the other, of the kind comprising an elastomer block resilient system interposed in the spaces separating armatures disposed in a ring and forming two sets fixed respectively to said shafts, with furthermore a centering core resiliently connected to the armatures, characterized by the fact that the centering core is rigidly locked to one of the shafts and that its resilient connection with the other shaft is provided by elastomer cushions placed between said core and the armatures fixed to the other shaft, these cushions being separate from the elastomer blocks separating the abovementioned armatures.

4,257,243

HOMOKINETIC DOUBLE JOINT FOR WIDE BENDING ANGLES

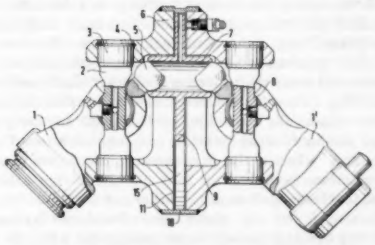
Paul Herchenbach, Ruppichteroth, Fed. Rep. of Germany, assignor to Jean Walterschied GmbH, Lohmar/Rhlid., Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 4,268

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1978, 2802572

Int. Cl.³ F16D *3/26, 3/34*

U.S. Cl. 64—17 R **3 Claims**



1. Homokinetic double joint for wide bending angles, particularly for the joint in a drive shaft between a drive member such as a tractor and a driven member such as an agricultural implement, comprising a double inner yoke, a pair of outer yokes, a pair of cross-links with each cross-link pivotally connecting one of said outer yokes to said double inner yokes with

said outer yokes connected to said double inner yoke at spaced positions thereon, said double inner yoke having an axial direction extending between said outer yokes and a radial direction extending transversely of the axial direction, a ball trunnion on the end of each said outer yoke which is closer to the other said outer yoke, a centering disc positioned in said double inner yoke between said cross-links and said centering disc being secured against movement in the axial direction of said double inner yoke and being movable in the radial direction of said double inner yoke, said centering disc having a guide member therein and said ball trunnions engaged within said guide member, wherein the improvement comprises that each said cross-link comprises a pair of first trunnions and a pair of second trunnions extending transversely of said pair of first trunnions, said double inner yoke having two pair of sides with said sides in each said pair spaced apart in the radial direction of said double inner yoke, each said outer yoke having a pair of sides spaced laterally outwardly from said ball trunnion thereon, each pair of said first trunnions secured in said sides of one of said outer yokes, each said pair of second trunnions secured into one of said pair of sides on said double inner yoke, the distance between the sides of each pair of sides on said double inner yoke being greater than the distance between said sides of said outer yokes, a bearing for each of said first and second trunnions, said bearings for each said second trunnions of said pairs thereof being pivotally positioned in spaced parallel planes and the effective distance between the bearings of each said pair of second trunnions being greater than the effective distance between the bearings of each said pair of first trunnions.

4,257,244

TELESCOPIC DRIVE SHAFT

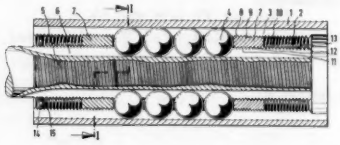
Hans-Heinrich Welschof, Rodenbach, Fed. Rep. of Germany, assignor to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 1,695

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1978, 2801182

Int. Cl.[3] F16D *3/06*

U.S. Cl. 64—23 **9 Claims**



1. Telescopic drive shaft comprising an axially extending inner shaft member, an axially extending outer shaft member laterally enclosing and spaced radially outwardly from said inner shaft member, roll bodies in contact with and positioned between said inner shaft member and outer shaft member for transmitting torque therebetween, said roll bodies disposed in at least two axially extending rows spaced angularly apart around said inner shaft member, and support means for said roll bodies, wherein the improvement comprises that said support means comprises at least one guide ring extending around said inner shaft member within said outer shaft member and located at one end of the rows of said roll bodies, said guide ring having a radially outer surface and a radially inner surface, said outer shaft member having a first thread on the inner surface thereof, said inner shaft member having a second thread on the outer surface thereof, said guide ring having a third thread on said radially outer surface in meshed engagement with said first thread and a fourth thread on said radially inner surface thereof in meshed engagement with said second thread, and the pitch of said first and third threads being opposite to the pitch of said second and fourth threads.

4,257,245

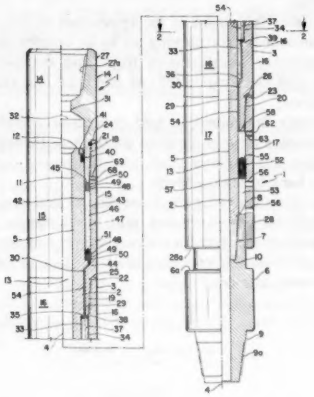
COMPRESSION SHOCK ABSORBER DEVICE

Lester Toelke, and J. D. Kimmel, both of Houston, Tex., assignors to Well Control, Inc., Houston, Tex.

Filed Sep. 13, 1979, Ser. No. 74,836

Int. Cl.[3] E12B *17/07*

U.S. Cl. 64—23 **34 Claims**



1. Shock absorber device for use in well bore drilling to absorb drill bit vibratory displacement shock comprising

a pair of slidably associated longitudinal elements having cooperating longitudinal coacting portions and cooperating longitudinal confinement wall portions, with one of such elements being operatively connectable to a component of a drill string and the other of such elements being operatively connectable to a drill bit,

said elements being interengageably interconnected along such coacting portions for common rotation about a longitudinal axis and for selectively limited relative reciprocal displacement longitudinally with respect to each other along such axis, and

temporarily internally compressible and resilient shock absorbing means of substantially self-sustaining selective three dimensional perimetric shape, disposed between such longitudinal confinement wall portions in substantially constant bilateral inter-supportive abutting contact with at least a portion of the common longitudinal extent of both of such wall portions and operatively arranged with respect to such elements to be placed under dynamic longitudinal stress corresponding to vibratory drill bit displacement shock upon such relative reciprocal displacement of the elements and being capable of supportively absorbing strain in internal direction and substantially within the confines of its three dimensional perimetric shape to reduce its starting volume substantially without expansion or deformation in external direction outside of the confines of its three dimensional perimetric shape when placed under pressure and of returning to its starting volume when such pressure is released.

4,257,246
ARRANGEMENT FOR THE CONTINUOUS TREATMENT, PARTICULARLY WASHING, OF TEXTILE MATERIALS

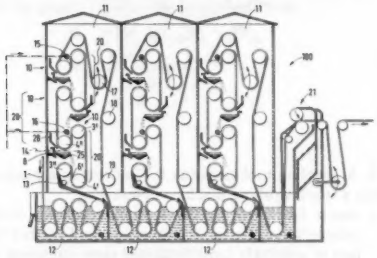
Werner Hartmann, Krefeld; Johannes Kutz, Tönisvorst, and Dieter Itgenshorst, Krefeld, all of Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Jul. 31, 1979, Ser. No. 62,303

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1978, 2834854

Int. Cl.³ D06B 5/08

U.S. Cl. 68—200 **9 Claims**



1. In an arrangement for the continuous treatment, especially washing, of spread out liquid permeable textile material in web form, comprising several deflection cylinders, over which the material is conducted and means for applying liquid to only the side of the textile material facing the deflection cylinders so that the liquid will be pushed through the textile material, the improvement comprising:

the deflection cylinders being provided in pairs close together but not touching each other, the textile material in web form passing immediately from one deflection cylinder of the pair to the other;

the deflection cylinder of each pair following the other in the web travel direction being arranged lower than the preceding deflection cylinder of the pair, with the textile material running substantially vertically over a short section when passing from the preceding to the following deflection cylinder of each pair; and the means for applying liquid being at a location preceding said following cylinder, at said section running substantially vertically and applying liquid to the side of said textile material facing said following deflection cylinder, whereby said liquid will be pushed through the textile material by said following deflection cylinder.

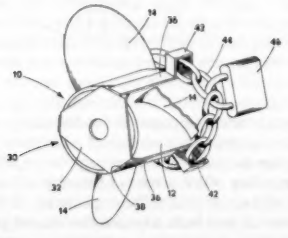
4,257,247
BOAT PROPELLOR SECURITY DEVICE

Gary F. Sims, 3518 Ridgewood Dr., St. Charles, Mo. 63301

Filed Aug. 7, 1978, Ser. No. 931,608

Int. Cl.³ F16B 41/00

U.S. Cl. 70—232 **10 Claims**



1. A security device for a boat propellor that is retained by a releasable lock to a propellor shaft, comprising cover means to prevent access to the releasable lock on the propellor shaft, means for releasably retaining the cover means to the propellor to prevent unauthorized removal of the boat propellor including means extending from said cover means and terminating in enclosed foot sections at the free ends thereof, each of said enclosed foot portions being positioned adjacent one side of said propellor blades opposite from said cover means when said cover means is mounted in place on said propellor, and releasable retaining means extending through the enclosed foot sections to prevent unauthorized disassembly of the security device form the propellor.

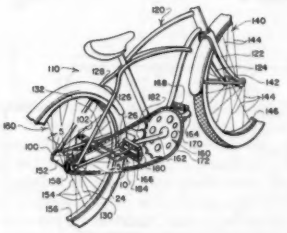
4,257,248
BICYCLE LOCK BRACKET

Earl Williams, 3912 E. 190th St., Cleveland, Ohio 44122

Filed Jan. 26, 1979, Ser. No. 6,721

Int. Cl.³ E05B 67/38, 71/00

U.S. Cl. 70—236 **12 Claims**



5. A bicycle lock bracket for receiving the shackle of a padlock to lock a pedal crank assembly and a rear wheel of a bicycle against rotation relative to the bicycle's frame, comprising:

(a) a pair of elongate, relatively rigid arms extending in spaced, side-by-side, overlying relationship, each of the arms having first and second ends;

(b) interconnecting means for interconnecting the arms in the vicinities of their first ends;

(c) lock receiving means for receiving the shackle of a padlock to interconnect the arms in the vicinities of their second ends;

(d) the arms being configured:

(i) to permit the bracket's being installed on a bicycle in a position wherein the spaced arms receive therebetween a portion of the bicycle's pedal crank assembly and portions of the bicycle's frame which lie on opposite sides of the bicycle's rear wheel, and wherein the spaced arms extend among the spokes of the bicycle's rear wheel, whereby rotation of the bicycle's pedal crank assembly and the bicycle's rear wheel relative to the bicycle's frame is restrained by the presence of the bracket in its installed position;

(ii) to permit the shackle of a padlock to be received by the lock receiving means after the bracket has been brought to its installed position; and,

(iii) to prevent removal of the bracket from its installed position so long as the shackle of a padlock is received by the lock receiving means;

(e) the interconnecting means including structure rigidly interconnecting the arms in the vicinities of their first-ends;

(f) the arms and the structure forming integral parts of an elongate member which has been formed to assume a substantially U-shapd configuration with the structure forming a curved base leg interconnecting the arms; and,

(g) the arms having been further formed to assume a substantially L-shaped configuration with separate parts of each

of the arms forming substantially orthogonally extending arm portions of the L-shaped configuration and with substantially right-angle corners interconnecting the arm portions.

4,257,249

COMBINATION LOCK

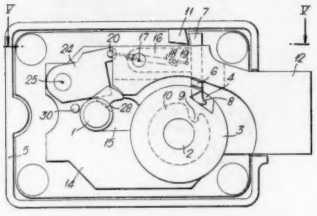
John Johns-Hunt, Wolverhampton, England, assignor to Chubb & Son's Lock and Safe Co., Ltd., London, England

Filed Nov. 8, 1978, Ser. No. 958,874

Claims priority, application United Kingdom, Nov. 11, 1977, 47110/77

Int. Cl.³ E05B *37/08*

U.S. Cl. 70—303 A **6 Claims**



1. In a combination lock comprising a rotary dial, a first shaft coupled to said dial, a plurality of co-axial rotary combination wheels mounted on a second shaft, said first shaft being offset from and drivingly connected to said second shaft, each of said combination wheels being formed with a circumferential notch, a driver cam co-axial with said combination wheels and also controlled by said dial, said driver cam being formed with a recess, a bolt assembly, a drop arm carried by said bolt assembly, a fence connected to said drop arm and co-operating with said combination wheels in such a way that when the notches in said combination wheels have been aligned by operation of said dial, said fence enters said notches and permits said drop arm to enter the recess in said driver cam, whereby further rotation of said dial causes retraction of said bolt assembly, the improvement which comprises an over-center mechanism for moving said fence between first and second positions with a snap action, said fence engaging said combination wheels only in said second position, said over-center mechanism comprising a lever arm about a point on said bolt assembly, a member mounted for movement between first and second positions in relation to said bolt assembly responsive to rotation of said first shaft, a stressed spring having two ends, means connecting a first end of said spring to said lever arm and a second end of said spring to said member, said first position of said member causing the line of action of said spring to pass to one side of the pivot point of said lever arm and said second position of said member causing the line of action of said spring to pass to the other side of the pivot point, whereby, when said member moves from one position to the other said lever arm is biased to move said fence between said first and second positions, and means controlling said member in response to rotation of first shaft in such a way that said fence remains in said first position for the majority of a revolution of said first shaft, being moved to said second position in which it is capable of entering the notches in said combination wheels only for the remaining small fraction of a revolution.

4,257,250

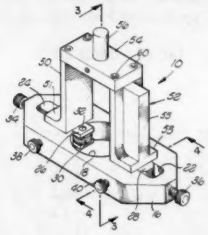
KNURLING TOOL

Ed W. Vanderhorst, 6718 Whitaker Ave., and Henry L. Vanderhorst, 6536 Langdon Ave., both of Van Nuys, Calif. 91406

Filed Mar. 26, 1979, Ser. No. 23,569

Int. Cl.³ B21H *1/00*

U.S. Cl. 72—108 **6 Claims**



1. A knurling tool assembly for impressing a piece of stock using a stock working machine comprising:

a planar face plate having a stock receiving orifice of a preselected diameter therethrough and further having a pair of angularly cross-sectioned slots extending from the stock receiving orifice into the planar face plate in the plane thereof;

a pair of interchangeable slide blocks, each slide block being slideably positioned in a different one of the slots and having a length along the slot which is less than the diameter of the stock receiving orifice, each slide block having a first end extending into the stock receiving orifice;

a pair of knurls each knurl rotatably mounted in the first end of a different one of the slide blocks; and

machine mounting means attached to the face plate for mounting the knurling tool to the stock working machine.

4,257,251

METAL FORMING PROCESS

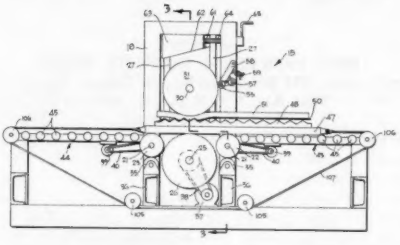
Harold R. Jury, Glynde, Australia, assignor to Flight Furniture Pty. Ltd., Glynde, Australia

Filed Mar. 27, 1979, Ser. No. 24,404

Claims priority, application Australia, Mar. 30, 1978, PD3830; Sep. 11, 1978, PD5889

Int. Cl.³ B21D *22/10*

U.S. Cl. 72—57 **13 Claims**



1. A metal forming process for deforming a workpiece to conform to a pattern on a surface of a die plate, comprising:

loading the die plate onto a carriage in a machine having a first pressing roller, a second pressing roller, a front load roller and a rear load roller respectively in front of and to the rear of, and both adjacent the second pressing roller and having their rolling surfaces cooperating with the rolling surface of the second pressing roller to define a

carriage support plane, all said rollers having parallel axes of rotation,

positioning the workpiece with one surface thereof contiguous with said pattern surface of the die plate,

positioning a flat sided slab of elastomeric material with one surface thereof contiguous with an opposite surface of said workpiece,

driving all said rollers simultaneously, and feeding the sandwich of said slab, workpiece, die plate, and carriage firstly over the front load roller, into the nip of the pressing rollers and then over the rear load roller, thereby supporting the carriage and die plate against deformation while at the same time deforming the workpiece on the pattern plate by plastic flow of the elastomeric slab.

4,257,252

MILL FOR ROLLING METAL STRIP

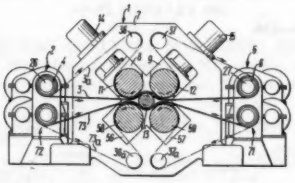
Vladimir N. Vydrin, ulitsa Timiryazeva, 28, kv. 27; Leonid M. Ageev, ulitsa Rossiiskaya, 200, kv. 28, and Anatoly P. Pellenen, ulitsa Degtyareva, 49a, kv. 48, all of Chelyabinsk, U.S.S.R.

Division of Ser. No. 836,400, Sep. 26, 1977, abandoned. This application Nov. 9, 1979, Ser. No. 92,958

Claims priority, application U.S.S.R., Nov. 17, 1976, 2416651

Int. Cl.³ B21B *1/24*

U.S. Cl. 72—232 **6 Claims**



1. A mill for rolling metal strips, comprising: a stationary working stand having a housing; at least three work rolls mounted in said stand and cooperating successively through the strip being rolled, at least two of said rolls being secured in chocks placed in said housing of the working stand, the axis of a middle work roll being offset with respect to a plane passing through the axes of the extreme work rolls in the direction of entry of a first strip being rolled into a first pair of said work rolls, defined by said middle work roll and a first extreme work roll along the path of rolling, and of exit of said first strip from a second pair of work rolls, defined by said middle work roll and a second extreme work roll; drive means for rotating said work rolls in opposite directions at different peripheral speeds increasing along the path of rolling; a screw down for at least one of said work rolls; means for decoiling said first strip; means for coiling said first strip; at least two live extreme work rolls mounted in said housing symmetrically with said extreme work rolls with respect to said middle work roll and being rotated in the same direction as said extreme work rolls; means for decoiling a second strip to be rolled simultaneously with said first strip; and means for coiling said second strip.

4,257,253

STAMPING APPARATUS WITH IMPROVED EJECTION MECHANISM

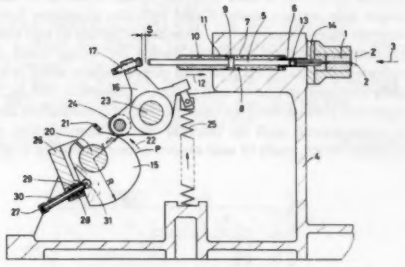
Hermann Zanzerl, Olsberg, Switzerland, assignor to Hatebur Umformmaschinen AG, Basel, Switzerland

Filed Dec. 19, 1978, Ser. No. 971,028

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758071

Int. Cl.³ B21D *45/00*

U.S. Cl. 72—345 **8 Claims**



1. In a stamping mechanism including a support, a die defining a cavity therein and fixedly mounted on said support, a punch reciprocable on said support in a direction inward and outward of said cavity for shaping a workpiece in said cavity, an ejector member movably mounted on said die for ejecting the shaped workpiece from said cavity, and drive means for actuating said ejector member, said drive means including a cam shaft having an axis and said cam shaft mounted on said support for angular movement back and forth about said axis between two terminal positions spaced apart by less than 360°, a cam member, mounting means mounting said cam member on said shaft for angular movement therewith, said cam member having a cam face extending in an arc about said axis, and motion transmitting means mounted on said support and sequentially engaging respective portions of said cam face during said angular movement of said shaft, said motion transmitting means engageable with said ejector member for moving the ejector member in response to varying spacing of the engaged portions of said cam face from said axis, the improvement which comprises:

(a) the angular length of said arc relative to said axis being greater than the angular spacing of said two terminal positions and being less than 360° and including said two terminal positions,

(b) said mounting means including means for mounting said cam member on said shaft in each of a plurality of positions angularly offset about said axis,

(c) the spacing of said sequentially engaged portions on said cam face from said axis increasing from a minimum value in one of said terminal positions during a first portion of said angular movement to a maximum value in an angular position of said shaft spaced between said terminal positions,

(1) whereby the stroke of said ejector member during said angular movement of said shaft may be varied by angularly shifting said cam member on said shaft.

4,257,254

ADAPTER CUSHION

Ronald A. Adamus, Cleveland, and Arlan H. Heiser, Brecksville, both of Ohio, assignors to Teledyne Industries, Inc., Cleveland, Ohio

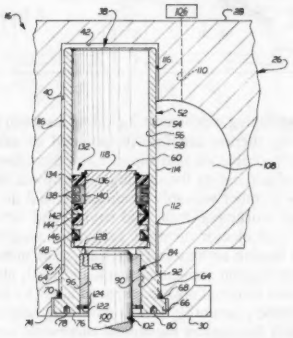
Filed Mar. 16, 1979, Ser. No. 21,228

Int. Cl.³ B21J *9/02*

U.S. Cl. 72—432 **28 Claims**

1. An adapter cushion for use in a press or the like with a die assembly having a plurality of projecting die pins, said adapter

cushion comprising a cylinder block having a first major side surface adapted to engage the press, a second major side surface extending parallel to said first major side surface and adapted to engage the die assembly, and a plurality of minor side surfaces extending between said major side surfaces, said cylinder block including surface means for defining a plurality of cylinder chambers having parallel central axes and disposed in an array in said cylinder block, each of said cylinder chambers having a cylindrical sidewall with an open end portion connected with said second major side surface and a closed end portion disposed in said cylinder block adjacent to said first major side surface, each of said cylinder chambers having an internal thread convolution disposed adjacent to said open end portion, a plurality of sleeve means for lining some of said cylinder chambers, each of said sleeve means being telescopically disposed in one of said cylinder chambers and having an open end portion with an external thread convolution disposed in engagement with an internal thread convolution in said cylinder block, each of said sleeve means including a cylindrical wall which at least partially defines a piston chamber, said open end portion of said sleeve means including surface means adapted to be engaged by a tool disposed adjacent to said second major side surface of said cylinder block to rotate said sleeve means relative to said cylinder block, a plurality of plug means for blocking some of said cylinder chamber, each of said plug means including external thread means for engaging said internal thread convolution and surface means adapted to be engaged by a tool disposed adjacent to said second major side surface of said cylinder block to rotate said plug means relative to said cylinder block, a plurality of pistons each of which is disposed in a piston chamber in one of said sleeve means, each of said pistons having an end portion which is adapted to be engaged by a die pin, and a plurality of passages connected in communication with a source of fluid under pressure and with at least one of said piston chambers to thereby provide fluid pressure in said piston chambers opposing movement of said pistons under the influence of the die pins during operation of the press.



4,257,255

APPARATUS FOR REPAIRING DEFORMED YIELDABLE STRUCTURES

Anastacio V. Sanchez, 10120 United Pl., Cupertino, Calif. 95014

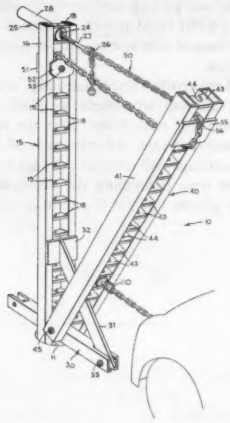
Filed Nov. 16, 1978, Ser. No. 961,297

Int. Cl.[3] B21D *1/12*

U.S. Cl. 72—455 **17 Claims**

1. Apparatus for supporting cable tensioning devices and for directing cables comprising:

(a) an upright guide frame seated in a post hole, said upright guide frame comprising transversely spaced, upright members, and transversely disposed, vertically spaced support members fixed to the confronting, inner walls of said upright members for forming spaces in which cable tensioning devices are respectively disposed to be supported by said upright guide frame; and



(b) a rigid base fixed intermediate the ends thereof to said upright members at the lower portion thereof and resting on a supporting surface for stabilizing said upright guide frame.

4,257,256

ULTRASONIC CROSS-SECTIONAL IMAGING APPARATUS

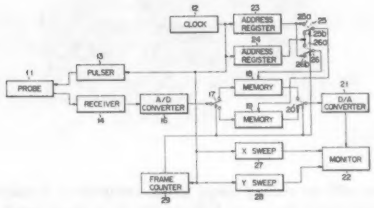
Noriaki Yoshikawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 21, 1979, Ser. No. 22,646

Claims priority, application Japan, Mar. 29, 1978, 53-36483

Int. Cl.[3] G01N *29/04*

U.S. Cl. 73—626 **6 Claims**



1. An ultrasonic diagnostic apparatus for providing a cross-sectional image of an object comprising:

ultrasonic probe means for emitting ultrasonic waves in a non-interlaced fashion and for producing frames of non-interlaced image data corresponding to the ultrasonic signal received;

memory means interconnected with said ultrasonic probe means for storing the non-interlaced image data therefrom, said memory means having two memory sections capable of alternately storing either the immediate frame of image data being produced by said ultrasonic probe means or the preceding frame of image data produced;

address means interconnected with said memory means and said probe means for writing in the image data corresponding to said immediate frame in a non-interlaced fashion in one of said memory sections and for simultaneously reading out of the other of said memory sections the image data corresponding to said preceding frame in an interlaced fashion; and

image display means interconnected with said memory means for displaying the frame of interlaced image data read out from said memory means.

4,257,257

METHOD AND APPARATUS FOR MEASURING CONCENTRATIONS OF GASEOUS OR VOLATILE SUBSTANCES IN LIQUIDS

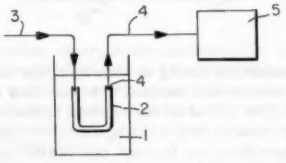
Kazuo Dairaku, and Kazuo Kuki, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 20, 1978, Ser. No. 961,945

Claims priority, application Japan, Mar. 13, 1978, 53-28817; Mar. 16, 1978, 53-30656; Mar. 31, 1978, 53-38458; Jul. 13, 1978, 53-85721; Jul. 17, 1978, 53-98489[U]

Int. Cl.³ G01N *7/10*

U.S. Cl. 73—19 **25 Claims**



1. A method of measuring the concentration of a gaseous or volatile substance in a liquid comprising the steps of immersing in the liquid a liquid-repellent porous partition tubing having pores with the pore sizes of 0.1 to 5 μm and minute channels extending through the wall of the tubing, passing a carrier gas through the partition tubing, leading the carrier gas to measuring means and detecting the quantity of the gaseous or volatile substance permeating through the tubing wall from the liquid and diffusing into the carrier gas to continuously or intermittently measure the concentration of the substance in the liquid.

4,257,258

EXHAUST GAS ANALYZER FOR DIESEL ENGINES

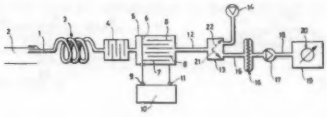
Johannes P. Bovenlander, Krommenie, Netherlands, assignor to Sun Electric Europe B.V., Amsterdam, Netherlands

Filed Aug. 22, 1979, Ser. No. 68,650

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1978, 2836787

Int. Cl.³ G01N *31/00*; B03C *3/01, 3/14*

U.S. Cl. 73—23 **12 Claims**



1. An exhaust gas analyzer apparatus having a conduit means including an inlet for receiving exhaust gas from an internal combustion engine and an outlet, said apparatus comprising:

(a) a gas analyzer device connected to the conduit means at the outlet thereof;

(b) electrostatic filter means interposed in said conduit means between the inlet and the gas analyzer device to receive said gas from said conduit means and to filter said exhaust gas for delivery to said gas analyzer device, said electrostatic filter means comprising ionization electrode means, first and second collector electrode means, an electrical power source and means connecting said electrical power source to said ionization electrode means and to at least one of said first and second collector electrode means;

(c) a source of pressurized fluid, and

(d) valve means interposed in said conduit means between said electrostatic filter means and said analyzer device and coupled also to said source of pressurized fluid for selectively controlling flow of said pressurized fluid to said electrostatic filter means and interrupting flow of exhaust gas to said gas analyzing device.

4,257,259

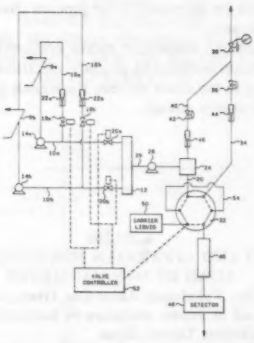
CONTINUOUS ANALYSIS OF BEVERAGES

Gregory A. Ford, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 883,015, Mar. 3, 1978, Pat. No. 4,204,962. This application Nov. 20, 1979, Ser. No. 96,109

Int. Cl.³ G01N *31/08*

U.S. Cl. 73—61.1 C **9 Claims**



1. A method for continuously analyzing individual streams of a plurality of streams of beverage containing carbon dioxide comprising passing each stream individually, at a pressure sufficient to prevent significant degassing of the beverage, through a filter means which separates said beverage into retentate containing materials of greater than a preselected molecular weight and a filtrate comprising substantially materials of less than said preselected molecular weight, passing said filtrate also under pressure sufficient to prevent significant degassing to a liquid column chromatographic analysis system wherein a sample of said filtrate is subjected to chromatographic analysis under pressure sufficient to prevent significant degassing of the filtrate sample.

4,257,260

PRESSURE SENSING APPARATUS AND ENGINE ANALYZING APPARATUS

Michael F. F. Beatson, Promiano 50021 Barberino Valdelsa, Florence, Italy, and Terence M. Nunn, 5a Castle St., Dover, Kent, England

Continuation-in-part of Ser. No. 9,908, Feb. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 810,454, Jun. 27, 1977, Pat. No. 4,146,875. This application Mar. 21, 1980, Ser. No. 132,448

Claims priority, application United Kingdom, Feb. 8, 1978, 5132/78; Feb. 8, 1978, 5133/78; Apr. 25, 1979, 14302/79

Int. Cl.³ G01F *9/00*

U.S. Cl. 73—119 A **29 Claims**

1. Apparatus for sensing fluid pressure in a pipe comprising:

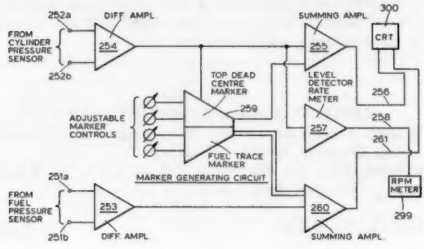
a pair of similar pipe contacting means arranged on assembly to surround the pipe, with each said means making contact with the pipe at symmetrically spaced locations;

means to hold the pipe contacting means releasably in assembled variation about the pipe and in contact therewith;

said pipe contacting means defining between symmetrically disposed adjacent pairs of said spaced locations a pair of beam portions which are similar and symmetrically arranged on opposite sides of the pipe;

said beam portions being subject to equal and opposite bending strains on dilatation of the pipe on change of pressure within it; and

similar electrical transducer means symmetrically disposed on the beam portions to produce electrical signals corresponding to the strain therein, the signals being equal and opposite at any instant.



4,257,261

METHOD AND APPARATUS FOR CONTROLLING LOAD OF DYNAMOMETER

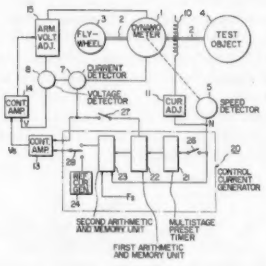
Masamichi Ono, Yokohama; Akira Eto, Hino, and Hideji Yagi Kawasaki, all of Japan, assignors to Kabushiki Kaisha Ono Sokki Seisakusho, Tokyo, Japan

Filed Oct. 30, 1978, Ser. No. 955,632

Claims priority, application Japan, May 25, 1978, 53-62574

Int. Cl.[3] G01L *3/22*

U.S. Cl. 73—134 **9 Claims**



1. A dynamometer load control method comprising the steps of measuring each time value it takes the dynamometer speed to vary from a preset speed level to the next preset speed level while the dynamometer is driven or coasted with a plurality of armature currents properly selected between −100% and +100% of the rated armature current, calculating dynamometer load values from the measured time values and the corresponding preset speed levels, storing the calculated load values together with the average speeds of the corresponding preset speed level pairs and the corresponding armature current values, and reading proper load, speed and current values in accordance with a targeted control load and a dynamometer speed to calculate a targeted control current corresponding to the targeted control load using interpolation.

4,257,262

TESTING APPARATUS FOR CASSETTE TYPE TAPE RECORDERS

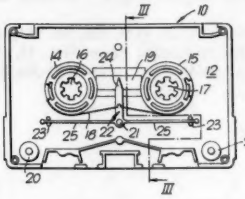
Peter R. Stanton, 76 Showground Rd., Castle Hill, Sydney, New South Wales, Australia 2154

Filed Jun. 26, 1979, Ser. No. 52,311

Claims priority, application Australia, Jun. 26, 1978, PD 4851/78; Sep. 20, 1978, 40016/78

Int. Cl.[3] G01L *3/18*

U.S. Cl. 73—134 **9 Claims**



1. Apparatus for testing cassette-type tape machines comprising a cassette shell adapted to be mounted on a machine under test, first second driven members displaceably mounted within the cassette shell and adapted to be engaged and displaced respectively by forward and rewind spindles of the machine, and means for indicating the torque applied by either of said spindles to the respective one of said driven members, the improvement comprising said indicating means including an indicator element spring biased to a rest position and displaceable against the spring biasing to either side of said rest position, and flexible means connecting the indicator element to each of said driven members whereby on rotation of either of said spindles the associated driven member is displaced against said spring biasing to displace the indicator means by an amount proportional to the torque applied.

4,257,263

TORQUE WRENCH

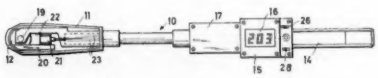
Rudolf Herrgen, Wermelskirchen, Fed. Rep. of Germany, assignor to Werkzeug-Union GmbH-DWU, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,495

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 2829009

Int. Cl.[3] G01L *5/24*

U.S. Cl. 73—139 **7 Claims**



1. A torque wrench having a head comprising:

an engaging member capable of being coupled antirotationally with a member to be tightened;

a handle lever movable within limits relatively to the engaging member;

a load sensor provided between the engaging member and the handle lever and controlling an indicating means;

wherein the load sensor is a piezoelectric body **(21)** fitted with electrodes connected with the input of an electric amplifier **(24)** which is fed by a battery **(18)** housed in the handle lever **(10)** and which controls an electronic indicator **(16)** and wherein the indicator **(16)** is inserted before a peak value memory **(25)** for retaining the maximum value of the measured torque.

4,257,264
TIRE CHECKING APPARATUS

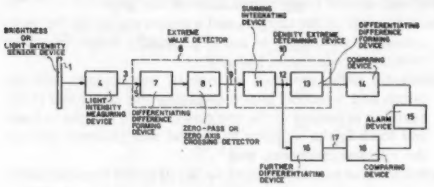
Hans Rottenkolber, Amerang, Fed. Rep. of Germany, assignor to Opto Produkte AG, Zürich, Switzerland

Filed May 21, 1979, Ser. No. 41,019

Claims priority, application Fed. Rep. of Germany, May 22, 1978, 2822204

Int. Cl.³ G01N *22/02*

U.S. Cl. 73—146 **12 Claims**



1. A tire checking apparatus for nondestructive testing for imperfection of materials of vehicle tires, aircraft tires, and the like, including laser beam emitting means and means for producing an interference pattern of at least one "meridian" section of the inner surface of the tire which is to be examined, said apparatus comprising;

brightness measuring means for ascertaining the brightness distribution of the pertaining interference pattern and for providing a corresponding output signal;

extreme value detector means operatively connectible to said extreme value detector means for receiving and processing the pertaining processed signal of said extreme value detector means and for providing a signal corresponding to the density extremes along said at least on "meridian" section;

means, operatively connectible to said density extremes determining means, for comparing said last recited signal with predetermined maximum acceptable threshold values for providing a trigger signal when said last recited signal exceeds the pertaining predetermined threshold value; and

indicator means operatively connectible to said comparing means for receiving trigger signals for thereupon providing an alarm signal indicating an unallowable imperfection in a tire.

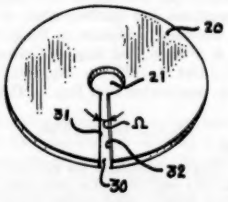
4,257,265
SELF-STRESSED MODE 1 FRACTURE MECHANICS TEST PIECE

Kenneth H. G. Ashbee, Bristol, England, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 19, 1979, Ser. No. 76,720

Int. Cl.³ G01N *3/08*

U.S. Cl. 73—150 A **7 Claims**



1. A method of manufacturing a self-stressed fracture mechanics test-piece, comprising the steps of:

a. fabricating a metal disc having a center and a radius of preselected length;

b. making a centrally-located opening in said metal disc;

c. cutting, and removing, a sector portion from said metal disc, whereby a sector-shaped space defined by two adjacent radial edges is formed;

d. shaping said metal disc, from which said sector portion has been removed, essentially into the form of a female cone having a gap between said two radial edges, with said gap being smaller than said sector-shaped space;

e. inserting a preselected adhesive, having a known critical strain energy release rate, in said gap between said two radial edges, whereby a glue line is formed;

f. closing said gap containing said adhesive by squeezing said metal disc across a chord perpendicular to said glue line and, simultaneously, by gripping said two radial edges until said adhesive is cured and said edges are thereby joined by bonding;

g. and, constraining said bonded female cone to be flat, thereby causing it be self-stressed.

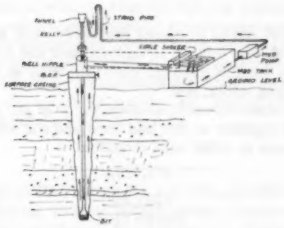
4,257,266
SAMPLE EXTRACTOR

Clarence L. Apple, 381 Albany, Shreveport, La. 71105

Filed Mar. 12, 1979, Ser. No. 19,775

Int. Cl.³ E21B *47/00*

U.S. Cl. 73—155 **17 Claims**



10. A method of extracting sealed, encapsulated samples of oil well drilling fluid comprising:

(a) loading empty sample capsules into a sampling mechanism;

(b) immersing said empty sample capsules in a stream of said fluid;

(c) sealing said sample capsules when said sample capsules contain a desired quantity of said fluid and while said sample capsules are immersed in said fluid; and

(d) removing said sample capsules from said fluid.

4,257,267
DISPENSER UNIT WITH LOCKABLE ACTUATING LEVER

Frederick L. Parsons, Ridgewood, N.J., assignor to Bohr Scientific Corporation, Morristown, N.J.

Filed Oct. 18, 1978, Ser. No. 952,559

Int. Cl.³ G01N *1/14*

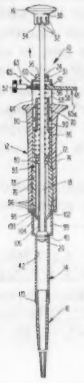
U.S. Cl. 73—425.6 **25 Claims**

1. A dispenser unit that is adjustable for dispensing a fluid in either single or multiple doses; said unit comprising:

an elongate actuator rod axially moveable in one direction to dispense the fluid;

a hand-engagable dispensing lever provided with a passageway through which said actuator rod extends, said actuator rod and lever being axially moveable relative to each other when said lever is disposed generally normal to the axis of said actuator rod, said passageway being provided with a surface that closely surrounds the actuator rod and locks against said rod when said lever is canted out of said generally normal position to thereafter permit the lever to move the actuator rod in said one axial direction to dispense the fluid;

spring means for applying a biasing force to said lever in a direction opposed to said one axial direction but permitting said lever to be canted and moved with said rod in said one axial direction by the application of a dispensing force to said lever that opposes the biasing force of said spring means, said spring means being adapted to move



said lever out of its canted orientation with said actuator rod, and then relative to said actuator rod when the dispensing force is removed from said lever at the end of a dispensing stroke; and

securing means moveable to cause the lever and actuator rod to lock together so that said lever and rod will move as a single unit in either axial direction.

4,257,268

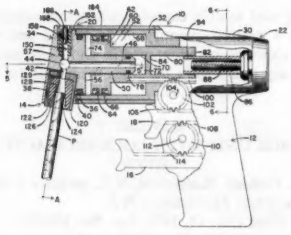
PIPETTER

Pasquale L. Pepicelli, Chelmsford, and Robert A. Mavilia, Braintree, both of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Filed Aug. 24, 1979, Ser. No. 69,351

Int. Cl.[3] **G01N** *1/14*

U.S. Cl. 73—425.6 **22 Claims**



1. A pipetter comprising

a pistol-shaped frame including a grip and cylinder,

a head mounted in the cylinder remote from the grip and having a front portion of large diameter sealed to the inner surface of said cylinder, said head also having a rear-portion of reduced diameter extending rearwardly in the cylinder and said rear portion being spaced from the inner surface of the cylinder,

a piston slidably mounted in the cylinder about the rear portion of the head and having a front portion sealed to the inner surface of the cylinder behind the front portion of the head and having a rear wall enclosing the back of the head,

a small vacuum chamber defined between the rear of the rear portion of the head and the rear wall of the piston and a large vacuum chamber defined between the rear of the front portion of the head and the front of the front portion of the piston and within the cylinder,

an adapter mounted in the front portion of the head for receiving one end of a pipette to be used with the pipetter,

first and second passages in the head connecting the adaptor to the small and large vacuum chambers for applying a vacuum to a pipette mounted in the adaptor,

first and second triggers mounted on the grip,

racks on each of the triggers and a pinion engaging the racks causing each trigger to move forwardly when the other moves rearwardly on the grip,

additional racks mounted on one of the triggers and the piston and a second pinion engaging the additional racks enabling actuation of the triggers to move the piston back and forth in the cylinder to expand and contract both of the vacuum chambers, and

selector valve means mounted on the cylinder for selectively connecting either the small vacuum chamber or both the small and large vacuum chambers to the adaptor for varying the rate at which fluid may be drawn into the pipette as the piston is moved back in the cylinder.

4,257,269

METHOD AND APPARATUS FOR PRODUCING VISIBLE IMAGE OF OBJECT

Ilia V. Berezin; Viktor S. Goldmakher; Alexandr M. Klibanov; Karel Martinek; Alexandr A. Mishin; Gennady P. Samokhin; Vladimir N. Smirnov; Vladimir P. Torchilin, and Evgeny I. Chazov, all of Moscow, U.S.S.R., assignors to Vsesojuzny Kardiologichesky Nauchny Tsentr Akademii Meditsinskikh Nauk SSSR, Moscow, U.S.S.R.

Filed Jul. 20, 1978, Ser. No. 926,324

Claims priority, application U.S.S.R., Jul. 20, 1977, 2502751; Jul. 20, 1977, 2502752

Int. Cl.[3] **G01N** *29/00;* **G03D** *13/00*

U.S. Cl. 73—606 **4 Claims**

1. An apparatus comprising:

an ultrasonic generator to generate ultrasonic waves illuminating an object;

a detector to receive and convert the ultrasonic waves passed through the object to a visible image of the object, said detector being in the form of a fermental plate having a structure sensitive to said ultrasonic waves; and

a means to develop said latent image.

4,257,270

ULTRASONIC IMAGING APPARATUS

Alfred Walz, Burgthann, and Adalbert Birk, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 3, 1978, Ser. No. 948,147

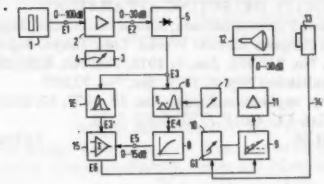
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747405

Int. Cl.[3] **G01N** *29/00*

U.S. Cl. 73—620 **4 Claims**

3. Ultrasonic imaging apparatus for ultrasonic-echo recording according to the impulse-echo principle, comprising an ultrasonic receiver which delivers the echo signals with a given dynamic range, an image recording device for the echo signals which manifests a non-linear output/input characteristic, a distortion circuit (**8**) connected between the ultrasonic receiver (**2**) and the image recording device (**12**) which distortion circuit distorts, according to a specifiable pattern, the

non-linear characteristic of the recording device (12), in dependence upon a predeterminable optimum dynamic range of the echo signals, and a threshold control circuit (6) connected in series with said distortion circuit (8), and having means whereby the threshold control circuit (8) has a specifiable threshold voltage (S), which lies above the amplitude of the interference ehcoes (STE), and is operable to transmit to said distortion circuit (8) such signal amplitudes (NE) which exceed the threshold voltage, and said threshold control circuit being operable to transmit said signal amplitudes (NE) which exceed



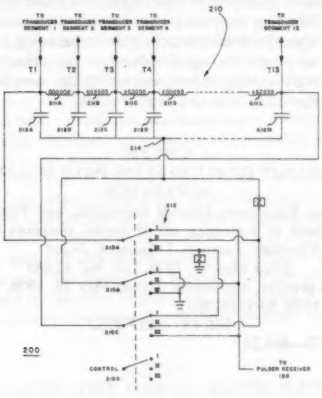
the threshold voltage true-to-intensity, while the interference echoes are suppressed, further comprising a contrast control circuit (9) having a contrast adjustment means (10) for controlling echo signal contrast adjustment, said recording device comprising a picture tube (12) having a photographic exposure apparatus coupled therewith including a photographic trigger mechanism for effecting exposure of a film material, said contrast adjustment means (10) being automatically operable in dependence upon the trigger mechanism such that the basic luminosity and image contrast is adjusted to the maximum contrast of the film material utilized.

4,257,271

SELECTABLE DELAY SYSTEM

William E. Glenn, Fort Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Jan. 2, 1979, Ser. No. 429
Int. Cl.[3] G01N *29/00*
U.S. Cl. 73—626 **8 Claims**



1. A selectable delay system for coupling between a plurality of elements and an input/output terminal, the relative delays between the input/output terminal and the individual elements being selectable under operator control, comprising:

a delay line having multiple fixed delay stages in a serially connected string;

means for coupling said delay stages to respective ones of said elements; and

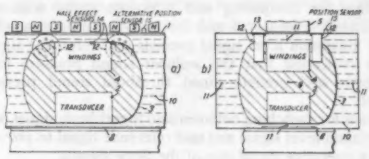
switching means for coupling, under operator control either one end of said delay line, or the other end of said delay line, or the common connection of said delay line, to said input/output terminal.

4,257,272

ULTRASONIC APPARATUS

Anthony W. Sloman, Ditchling, England, assignor to E M I Limited, Hayes, England

Filed Aug. 8, 1979, Ser. No. 64,842
Int. Cl.[3] G01N *29/00*
U.S. Cl. 73—633 **22 Claims**



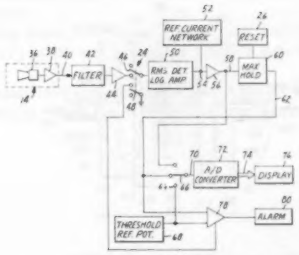
1. An ultrasonic examination apparatus including: a liquid filled scanning head; an ultrasonic transducer arrangement including at least one ultrasonic transducer, mounted in the scanning head to be immersed in the liquid; guide means adapted to allow the transducer arrangement to be capable of a translational scanning motion through the liquid; and drive means for causing a reciprocating translational movement of the transducer arrangement, wherein the density of the liquid and the mean density of the transducer arrangement are chosen so that the transducer arrangement is neutrally buoyant in the liquid with the centre of gravity and centre of buoyancy thereof being substantially coincident.

4,257,273

SOUND PRESSURE LEVEL METER

Michael J. Knowd, Vadnais Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 26, 1979, Ser. No. 60,926
Int. Cl.[3] G01H *3/14*
U.S. Cl. 73—647 **4 Claims**



1. In a device adapted to provide a digital display of sound pressure levels over an extended range of levels including

(a) means for detecting ambient sound pressure levels occurring in real time and for converting said detected levels into an electrical signal indicative thereof;

(b) means responsive to said electrical signal for providing a logarithmic signal; linear excursions of which correspond to a logarithm of the root mean square (rms) value of said real time ambient sound pressure level, said logarithmic signal providing means including

(i) means for amplifying said electrical signal, and for providing a bipolar signal of which linear excursions, both positive and negative with respect to a reference potential correspond to the logarithm of the root mean square (rms) value of said ambient sound pressure level;

(ii) means for establishing a predetermined negative current, and

(iii) means for summing said bipolar signal and said predetermined negative current to provide a unipolar logarithmic signal, which corresponds to variations in ambient sound pressure levels;

(c) means responsive to said logarithmic signal for generating and holding a maximum level signal corresponding to the logarithm of a maximum sound pressure level;

(d) means for resetting said generating and holding means;

(e) means for providing a reference signal representative of a predetermined threshold sound pressure level;

(f) means for comparing said reference signal with said maximum level signal and for initiating an alarm when said maximum level signal exceeds said reference signal, thus indicating that the ambient sound pressure level exceeds said predetermined threshold sound pressure level;

(g) means for switching between said logarithmic signal, said maximum level signal and said reference signal to provide as an operative signal one of the three signals;

(h) means for converting said operative signal into a decimal equivalent thereof; and

(i) means for displaying said decimal equivalent, whereby said display means is adapted to selectively and reversibly display a representation of either said ambient sound pressure level, said maximum sound pressure level, or said predetermined threshold sound pressure level without the display of one said level affecting or preventing the subsequent display of the other and the display of the representation of said predetermined threshold level enables ready awareness of said threshold level and convenient adjustment of said reference signal corresponding to a desired threshold level.

4,257,274

CAPACITIVE PRESSURE SENSOR

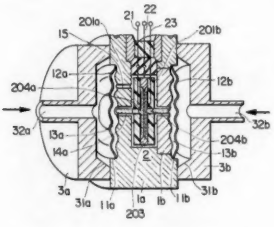
Satoshi Shimada; Kanji Kawakami, and Motohisa Nishihara, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 23, 1979, Ser. No. 59,552

Claims priority, application Japan, Jul. 21, 1978, 53/88450

Int. Cl.³ G01L *9/12*

U.S. Cl. 73—718 **11 Claims**



1. A capacitive pressure sensor comprising:

a conductive silicon diaphragm having at least at one side thereof a thick peripheral supporting portion and a thin deflecting portion which may be deflected depending on the pressure applied thereto, said thin deflecting portion being surrounded by said thick peripheral supporting portion so as to form a hollow at said one side of said diaphragm;

a substrate of borosilicate glass having an aperture formed therein and at least a flat side face disposed against said one side of said conductive silicon diaphragm so that said hollow of said diaphragm and said flat side face of said substrate form a pressure chamber into which a fluid under pressure to be detected may be supplied through the aperture; and

at least a conductive thin layer provided on a portion of said flat side face of said substrate in said pressure chamber so as to be opposed to said diaphragm thereby forming electrostatic capacity between said conductive thin layer and said conductive silicon diaphragm;

said conductive silicon diaphragm and said substrate being rigidly joined by a process of anodic bonding to seal said pressure chamber, said joining including said thick supporting portion of said diaphragm and a portion of said substrate.

4,257,275

VELOCITY DETECTING APPARATUS

Yoshio Kurita, and Yukitake Shibata, both of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

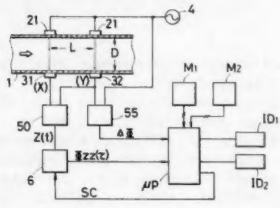
Division of Ser. No. 912,954, Jun. 6, 1978, Pat. No. 4,201,083.

This application Sep. 4, 1979, Ser. No. 72,007

Claims priority, application Japan, Jun. 10, 1977, 52/69269

Int. Cl.³ G01F *1/70;* **G01P** *5/18*

U.S. Cl. 73—861.06 **3 Claims**



1. A velocity detecting apparatus comprising:

means for detecting noise signals obtained from a relatively moving object at two or more points spaced apart from each other in the direction of the motion;

an operational circuit for computing the phase difference between the two signals from said noise-signal detecting means;

an autocorrelator receiving an input signal from said operational circuit; and

a processor receiving an input signal from said autocorrelator, detecting the peak point of the auto-correlation function signal from said autocorrelator, executing a computation to produce a signal related to the velocity of said relatively moving object, and setting the sampling rate of said autocorrelator to a proper value.

4,257,276

PROBE UNIT OF FLUID FLOW RATE MEASURING APPARATUS

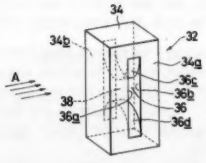
Toru Kita, Yokohama; Hiroshi Kobayashi, and Takeshi Fujishiro, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 25, 1979, Ser. No. 42,463

Claims priority, application Japan, May 29, 1978, 53-63340; Aug. 30, 1978, 53-118810[U]

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.22 **9 Claims**



1. A probe unit of a fluid flow rate measuring apparatus

which measures a flow rate of a fluid, comprising a vortex generating body arranged to lie across the fluid stream substantially at right angles to the flow direction of said fluid, said body including a slot which extends therethrough substantially perpendicular with respect to the flow direction of the fluid, and transducer means responsive to variations in hydrodynamic conditions within said slot for converting hydrodynamic variations into variations of an electrical parameter of said transducer means wherein said slot is bounded at its upper and lower opposed sections by convexly curved surfaces so that the sectional area of said slot is gradually decreased with increase of distance from each of the entrances of said slot to the middle of the same, thereby leaving at the middle section of the slot a throat portion.

4,257,277

FLOW MEASURING DEVICE

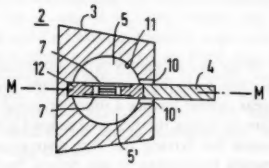
Martin Klobe, Karlsruhe, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 19, 1979, Ser. No. 58,759

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831823

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.24 **9 Claims**



1. A flow measuring device according to the principle of the Karman vortex which comprises;

a vortex generating choke body having a prismatic part of trapezoidal cross-section said prismatic part having a larger first surface and a smaller second surface in parallel alignment and said choke body having a parallelepiped-shaped extension projecting away from said smaller surface of said prismatic part and substantially perpendicular thereto such that the intersecting smaller surface and the surfaces of the parallelepiped extension define inside corners on both side of said parallelepiped extension;

two pressure chambers positioned in said prismatic part, and extending the length thereof such that the longitudinal axis of one said chambers is parallel to the longitudinal axis of the other chamber and to the longitudinal axis of said first and second surfaces of said prismatic part;

two or more openings at least one of which is positioned along each of said inside corners to provide pressure conducting communication between each of said chambers and the exterior of said choke body; and

pressure pickups for measuring periodic pressure variations.

4,257,278

QUANTITATIVE VOLUME BLOOD FLOW MEASUREMENT BY AN ULTRASOUND IMAGING SYSTEM FEATURING A DOPPLER MODALITY

Emmanuel Papadofrangakis, Schenectady, N.Y., and John A. Fakiris, Holly Hill, Fla., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 24, 1979, Ser. No. 69,357

Int. Cl.³ G01F *1/66*

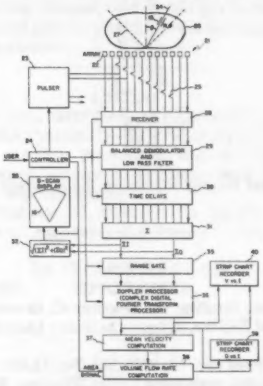
U.S. Cl. 73—861.25 **6 Claims**

1. A method of measuring the volume flow rate of blood and similar liquids using an ultrasound system which generates ultrasonic beams for performing a sector scan and has a common transducer array for imaging and Doppler modalities, comprising the steps of:

imaging on a B-scan display a vessel through which the volume flow rate is to be measured, and approximately aligning one ultrasonic beam with the axis of said vessel;

selecting the number of active array transducer elements for transmit and receive to realize a beam cross section that is approximately equal to the vessel cross section at a given range, which is the sample volume, and producing an area signal representative of the latter cross section;

alternately transmitting ultrasonic beams to insonify the sample volume and detecting received echoes using only the selected active array elements, and processing the



received echoes to yield focused in-phase and quadrature signals;

gating said focused signals after every transmission for a short interval to extract a pair of analog samples representing echoes backscattered from the sample volume;

analyzing sets of pairs of analog samples to derive the magnitude and sign of the distribution of frequency shifts of echoes with respect to a known ultrasound emission frequency;

deriving mean flow velocity from said distribution of frequency shifts and generating a signal indicative thereof; and

presenting said area and mean flow velocity signals to circuitry in which the volume flow rate is calculated.

4,257,279

ROTAMETER WITH FLOAT GUIDE MEMBERS

Joachim Marx, Mulheim-Ruhr, Fed. Rep. of Germany, assignor to Hivolin GmbH, Fed. Rep. of Germany

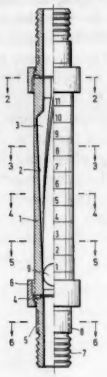
Filed Jun. 15, 1979, Ser. No. 48,858

Int. Cl.³ G01F *1/22*

U.S. Cl. 73—861.57 **9 Claims**

1. A flowmeter for fluids comprising a transparent vertical tube widening in upward direction, a ball freely disposed within said tube so as to be carried upward in dependence upon the flow, and a plurality of helical guide members on the inside of said tube, the guide members having inner edges which extend substantially vertically so that the free cross-sectional

area for movement of the ball is substantially the same at all heights of the tube, the guide members minimizing pendulating



of the ball and thereby increasing the accuracy of measurement.

4,257,280

GYROSCOPES

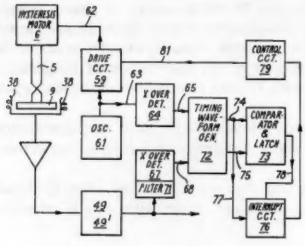
Peter H. Coles, Reading, and Geoffrey C. Downton, Wokingham, both of England, assignors to Sperry Limited, Berkshire, England

Filed Sep. 10, 1979, Ser. No. 73,823

Claims priority, application United Kingdom, Sep. 20, 1978, 37409/78

Int. Cl.³ G01C *19/08*

U.S. Cl. 74—5.6 E **7 Claims**



1. An improved gyroscope of the type having a rotatable sensitive element coupled to a hysteresis motor wherein the improvement comprises:

electromagnetic means for generating a waveform wherein any point on said waveform relates to an exclusive point on said rotatable sensitive element;

means for detecting an identified point on said waveform generated by said electromagnetic means,

means for detecting the position of a pole vector associated with said hysteresis motor;

comparator means responsive to said means for detecting an identified point and means for detecting the position of a pole vector to compare the phase of said pole vector with respect to said identified point and produce an output signal; and

means for controlling said hysteresis motor responsive to the output signal of said comparator means, whereby the phase of said pole vector is adjusted relative to said identified point to make substantially constant the vibration on said rotatable sensitive element.

4,257,281

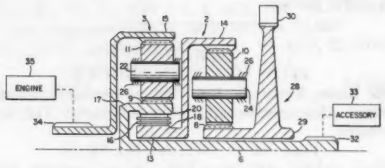
ENGINE STARTER AND ACCESSORY DRIVE APPARATUS

Dennen J. Bunger, Clinton, N.Y., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Jun. 25, 1979, Ser. No. 51,603

Int. Cl.³ F02N *15/02*

U.S. Cl. 74—6 **6 Claims**



1. Engine starter and accessory drive apparatus, comprising:

a first gear system having a predetermined gear ratio;

a second gear system having a predetermined gear ratio;

clutch means coupling the first and second gear systems;

starting means for driving the first gear system, with the clutch means responding to the driven first gear system for driving the second gear system to start the engine;

engine driving means coupled to the second gear system and driven thereby for starting the engine when the second gear system is driven, and driven by the engine for driving the second gear system after the engine has been started, with the clutch means being thereupon effective for uncoupling the first and second gear systems;

accessory driving means coupled to the second gear system and driven thereby to drive the accessory; and

the predetermined gear ratios of the first and second gear systems being related so that the engine driving means is driven by the engine and the accessory driving means is driven by the second gear system at different speeds.

4,257,282

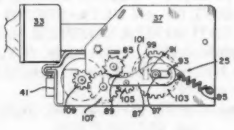
TRANSPORT SYSTEM FOR A DOT MATRIX PRINTING MECHANISM

Robert H. Wilczewski, and James E. Blomquist, both of 203 E. Main, Riverton, Wyo. 82501

Filed May 14, 1979, Ser. No. 38,910

Int. Cl.³ G05G *1/00;* **B41J** *19/80*

U.S. Cl. 74—125 **5 Claims**



1. A feed pawl arrangement for advancing a ratchet, said feed pawl arrangement comprising:

a first toothed ratchet and means for mounting said first ratchet for movement about a fixed axis,

a one-piece feed pawl and means for mounting said feed pawl for movement relative to said fixed axis, said feed pawl being elongated and having first and second end portions and a middle portion with two substantially planar, parallel sides extending between said first and second end portions, said planar sides being substantially perpendicular to said fixed axis of said first ratchet, said first end portion having a catch member, said middle portion having a slot therethrough elongated in the directions of said first and second end portions and having respectively first and second ends, and said mounting means including a shaft extending along an axis and having a diameter less than the distance between the first and second ends of said elongated slot, said shaft being mounted in said slot with the axis of said shaft substantially parallel to said fixed axis of said first ratchet, and,

means for cyclically moving said one-piece feed pawl to progressively engage the teeth of said first ratchet with said catch member and cause said first ratchet to rotate about said fixed axis, said moving means including first means for biasing said one-piece feed pawl in a direction away from the fixed axis of said first ratchet with said shaft abutting the first end of said elongated slot, and said moving means further including cam-follower means for alternately moving said feed pawl against the force of said first biasing means toward said ratchet to engage the catch member with a tooth of said first ratchet and alternately permitting said first biasing means to draw said feed pawl and engaged tooth away from the fixed axis of said first ratchet causing said first ratchet to rotate, said cam-follower means including a cam member asymmetrically mounted about said shaft and a follower member integrally mounted to one side of said feed pawl adjacent the middle portion thereof.

4,257,283
STEPPING MECHANISM FOR A MULTI-POSITION SWITCH

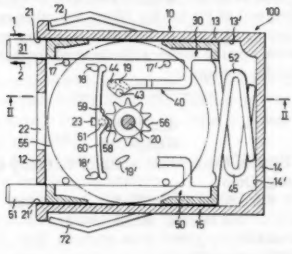
Heinrich Haller, Fahrweid/Geroldswil, and Hans Wermelinger, Rümlang, both of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Filed Feb. 28, 1979, Ser. No. 16,016

Claims priority, application Switzerland, Mar. 17, 1978, 2922/78; Nov. 8, 1978, 11476/78

Int. Cl.³ F16H *27/02*

U.S. Cl. 74—128 **6 Claims**



1. A forwardly and rearwardly indexible stepping mechanism for a multi-position switch, the stepping mechanism being arranged in a housing and containing two individual, functionally separated actuation elements, each provided with a respective push button, a plunger and a switching element having front and back regions and top and lower sides, upon which actuation element a restoring spring acts and which actuation element can be brought, by a linear work movement, into engagement with the gear of a character support, said gear being arranged at the axis of symmetry of the housing and being operatively connected to a latching spring, comprising the improvements of:

(a) the switching element formed at the plunger of the actuation element is structured to be elastically bendable and during each indexing step, is directed in opposition to the restoring forces and is automatically deflected out of a rest position and brought into engagement with the gear and after completion of the indexing step, can be returned, by the spring force, back into the rest position;

(b) a first pin located at the front region at the lower side of said switching element, said pin being guided at a cam provided in the housing for producing said automatic deflection of said actuation element; and

(c) a second pin, located at the front region at the top side of said switching element, said second pin being capable of engaging said gear for producing said indexing step at said switching element.

4,257,284
NOISELESS SHIFTING APPARATUS FOR A TRANSMISSION REVERSE GEAR

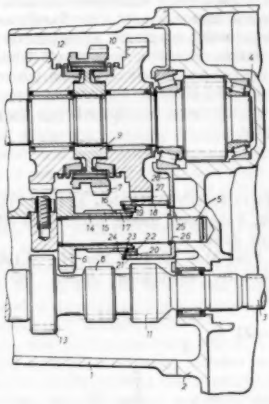
Karl Ashauer, and Fritz Blumenstein, both of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 17, 1978, Ser. No. 961,773

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1977, 2751699

Int. Cl.³ F16H *3/38, 3/08*

U.S. Cl. 74—339 **8 Claims**



1. A speed changing transmission, in particular a motor vehicle transmission, comprising:

(a) a first gear arranged on a first transmission shaft;

(b) a second gear arranged on a second transmission shaft, said second gear being wider than said first gear;

(c) a third gear rotatably mounted on a third shaft, said third gear being axially displaceable and arranged to engage said first and second gears, said third gear having synchronizing means including:

(1) a sleeve, arranged concentrically with said third shaft and fixed in its axial and circumferential directions, said sleeve having an inner cone;

(2) a braking ring rotatably mounted within said sleeve and having an outer cone cooperating with the inner cone of said sleeve; and

(3) locking means, arranged on said third gear and said braking ring, for braking said third gear when it is shifted into the engaged position;

whereby said third gear is a reverse gear of said transmission which may be noiselessly engaged with said first and second gears.

4,257,285

ROLLER DOOR OPERATING MECHANISM

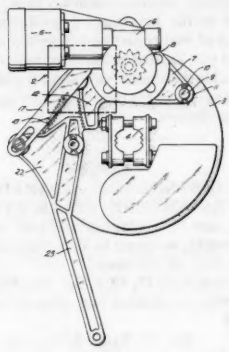
Martin H. Whitehouse, Northmead, and Mitchell J. Billows, East Hills, both of Australia, assignors to Byrne & Davidson Doors (N.S.W.) Pty. Limited, New South Wales, Australia

Filed Feb. 12, 1979, Ser. No. 11,677

Claims priority, application Australia, Feb. 15, 1978, PD3382; Mar. 16, 1978, PD3742

Int. Cl.[3] G05G 5/08

U.S. Cl. 74—405 5 Claims



1. A door drum driving mechanism comprising a pivotally mounted electric motor, a gear train fixedly associated with said motor terminating in a pinion, a ring gear on said drum and manually operable releasable latch means which secure said motor and train in an operative position wherein the pinion meshes with the ring gear but, when released permit the motor to move to an inoperative position wherein the pinion is clear of the ring gear.

4,257,286

PRECISION DRIVING APPARATUS

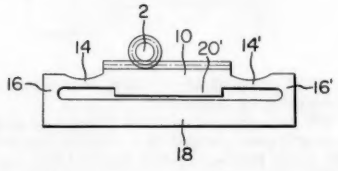
Isao Ohyama, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 16, 1979, Ser. No. 21,190

Claims priority, application Japan, Mar. 22, 1978, 53/35500[U]

Int. Cl.[3] F16H 1/04

U.S. Cl. 74—422 3 Claims



1. In a precision driving apparatus comprising a pinion and a rack, said rack comprising the following integral parts (a) to (d) formed together by monoblock molding of synthetic resin material:

(a) a toothed part having teeth engageable with the pinion;

(b) a base part for supporting said toothed part, said base part being disposed opposed to a surface of said toothed part lying at the opposite side to the toothed surface side;

(c) a connection part for resiliently connecting both ends of said toothed part with both ends of said base part so as to allow said toothed part to be displaced only in the direction normal to the direction in which said rack is moved, without said toothed part itself being deformed; and

(d) a limitation part for limiting the distance between said toothed part and said base part to a value less than the module of the teeth of said toothed part to prevent the engagement between said toothed part and said pinion from getting shallow by any external force exerted thereon in the direction of movement of said rack and to prevent the tooth top of said toothed part or of said pinion from being broken away.

4,257,287

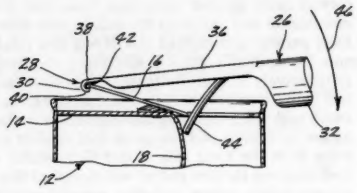
BEVERAGE CAN OPENER

John C. Dawson, 3817-16th St., Des Moines, Iowa 50313

Filed Jul. 5, 1979, Ser. No. 54,854

Int. Cl.[3] B67B 7/40

U.S. Cl. 81—3.34 4 Claims



1. An apparatus for opening a beverage can having a top wall with a scored section and an opener tab secured adjacent one end to said top wall with the other end thereof overlying said top wall for opening the can by depressing said scored section into said can in response to lifting of said other end of the tab, comprising,

a tool having spaced apart forward and rearward ends with a longitudinal axis, said tool including a hook portion at the forward end thereof, a handle portion at the rearward end thereof, and a leg member extended downwardly and forwardly from said tool;

said leg member extending downwardly and forwardly from said tool in longitudinally spaced relation forward of said handle portion and rearward of said hook portion for simultaneously depressing said scored section into the can and providing a fulcrum for lifting movement of said hook portion in response to downward movement of said handle portion;

said hook portion including an upper portion connected to and extended forwardly from said handle portion and a lower portion extended downwardly and rearwardly from said upper portion to define a channel whose axis is perpendicular to said longitudinal axis adapted to receive the other end of the tab for lifting the other end of the tab and opening the can in response to lifting movement of said hook portion when a downward force is applied to said handle portion.

4,257,288

WRENCH

Andrew S. Bianco, Lima, Ohio, assignor to Huffy Corporation, Miamisburg, Ohio

Filed Mar. 19, 1979, Ser. No. 22,020

Int. Cl.[3] B25B 13/52

U.S. Cl. 81—66 R 1 Claim

1. A wrench comprising:

a substantially wide, flat, flexible metal strap having a length less than the circumference of an article to be gripped by said wrench,

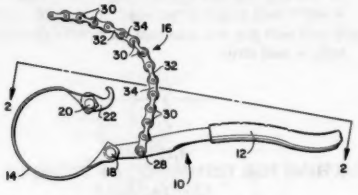
a single, substantially rigid handle,

means pivotally connecting said strap adjacent a first end thereof to an end of said handle,

a link chain consisting of a series of regularly spaced pins interconnected by pairs of spaced side plates,

said pins and side plate defining open areas between each of said pairs of side plates and adjacent pins,

means permanently connecting said chain adjacent a first end thereof only to only said handle at a position on said handle spaced inwardly from said end thereof,



a single hook movable into said open areas and engageable with said pins of said chain, and

means pivotally mounting said hook on said strap adjacent a second end thereof.

4,257,289

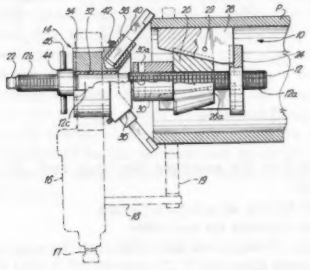
PORTABLE PIPE END BEVELLING TOOL

William Groothius, Calgary, Canada, assignor to Project Construction Services Ltd., Canada

Filed Mar. 5, 1979, Ser. No. 17,621

Int. Cl.³ B23B *5/16*

U.S. Cl. 82—4 C **8 Claims**



1. A portable pipe end bevelling tool comprising:

a shaft,

a mandrel mounted at a forward end of said shaft, said mandrel having movable jaws and means for moving said jaws outwardly into firm gripping engagement with the interior of a pipe end to be bevelled so as to hold said shaft coaxial with said pipe end,

a tool hub supported by a rearward end portion of said shaft, said tool hub being rotatable relative to the shaft and having means for engagement with a power drive for rotating said hub,

means for feeding said hub forwardly relative to said shaft during a bevelling operation

said tool hub having cylindrical bores the axes of which lie in a direction extending outwardly and forwardly from the hub, said recesses each being provided with a tool holding sleeve having an external surface fitting closely within the respective recess and defining a central cavity of rectangular cross section for receiving the shank of a cutting tool of like cross section, said sleeves projecting outwardly beyond the maximum outer diameter of said hub, and said hub including screw means for holding said cutting tools in place and allowing easy replacement of said tools wherein the cutting tools, sleeves, hub and mandrel are dimensioned so that said bevelling tool can bevel a pipe having an inner diameter greater than the maximum diameter of the hub.

4,257,290

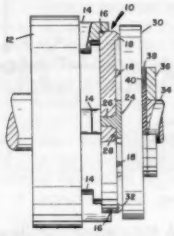
CHUCK FOR MACHINING EQUIPMENT

Morris B. Scott, 1621 Woodbourne Ave., Baltimore, Md. 21239

Filed Oct. 3, 1978, Ser. No. 948,352

Int. Cl.³ B23B *33/00*

U.S. Cl. 82—40 R **4 Claims**



1. A chuck for machining disc-like work pieces in a single set-up comprising:

a body member, said body member being flat and disc-like, said body member having a first face and a second face, said body member having a centrally located cylindrical aperture therethrough;

a plurality of tooth-like projections, said tooth-like projections being affixed to said first face of said body member, each said tooth-like projection having at least one tapered side to provide a small flat top-side surface that interfaces with said work pieces, said tooth-like projections being spaced around the periphery of said body member;

a work piece centering member, said work piece centering member being flat and disc-like and having a first face and a second face, said work piece centering member having a cylindrical projection centrally located on said second face thereof, said work piece centering member being slidably and removably affixed to said body member by slidably and removably inserting said cylindrical projection into said cylindrical aperture in said body member, thereby said work piece centering member being centrally located on said first face of said body member, said flat and disc-like portion of said work piece centering member extending beyond said first face of said body member to slidably and removably centrally engage a work piece without attachment thereto; and

a locking pin, said locking pin being affixed to said second face of said work piece centering member and being slidably and removably inserted into a mating hole in said body member, thereby securing said work piece centering member to said body member in position.

4,257,291

APPARATUS FOR MAKING HOLES IN MOVING CARDS OR THE LIKE

Hans Buchmann, Oetwil, Switzerland, assignor to Zühlke Engineering AG, Schlieren, Switzerland

Filed Mar. 26, 1979, Ser. No. 24,010

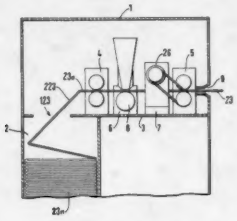
Claims priority, application Switzerland, Mar. 31, 1978, 3457789/78

Int. Cl.³ G06K *1/05*

U.S. Cl. 83—71 **19 Claims**

1. Apparatus for making holes in a sheet-like carrier of information, comprising means for transporting the carrier at a predetermined speed and in a predetermined direction along a first path; a matrix disposed at one side of said path; a perforating tool disposed at the other side of said path opposite said matrix; holder means for said tool and said matrix; means for moving said holder means with said tool and said matrix in and counter to said direction along an acruate second path which is so oriented relative to said first path that said tool and said matrix move along trajectories which maintain their respective

distances from the carrier transported in the first path, and at a varying speed so that, during a predetermined interval of movement of said holder means in said direction, the speed of said tool and said matrix at least closely approximates said



predetermined speed; and means for shifting said tool substantially at right angles to its trajectory and to said direction toward said matrix to thereby perforate the carrier portion between said matrix and said tool during selected intervals of movement of said holder means in said direction.

4,257,292

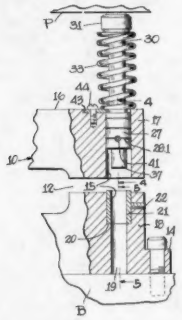
PIERCING UNITS

James K. Faull, Rte. 1, Box 156, Enon Valley, Pa. 16120

Filed Nov. 30, 1979, Ser. No. 98,858

Int. Cl.[3] **B21D** *28/34, 45/08*

U.S. Cl. 83—146 **7 Claims**



1. A piercing unit for punching a hole in a strip, comprising:

a metal body having a side gap into which said strip is entered flatwise for piercing purposes, said gap being defined at least in part by overlying top and bottom body legs, said legs having a vertical hole drilled entirely through the top leg and partway through the lower leg to leave an interior shoulder in the latter,

a die sleeve closely disposed within the hole in said lower leg, having its lower end bearing against said shoulder to back up said die sleeve during punching operations, said die sleeve having its upper end in line with or slightly above the upper surface of said lower leg,

a punch holder slide slidable with close tolerance through the hole in said upper leg,

a stripper bolt having a lower threaded end of a diameter less than the shank of said bolt to provide a shoulder therebetween, said bolt threaded end being threaded into an opening in the upper end of said punch holder slide until said bolt shoulder abuts said upper end of said punch holder slide to back up the same during punching operations, said stripper bolt having an upper abutment and a stripper spring between said bolt abutment and the upper surface of said top leg, and

a punch carried by said punch holder slide for cooperation with said die sleeve, whereby

with said body held stationary and downward force applied to said bolt abutment, said punch holder slide is depressed to move said punch downward through the strip disposed in said side gap and into said die holder sleeve to punch a hole in said strip.

4,257,293

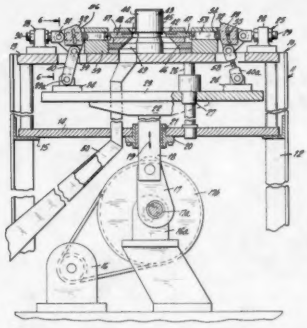
MACHINE FOR TRIMMING THE EDGES OF METAL CONTAINERS

William Stahl, Chatham, N.J., assignor to National Manufacturing Company Inc., Chatham, N.J.

Filed Jul. 16, 1979, Ser. No. 58,107

Int. Cl.[3] **B23D** *21/00*

U.S. Cl. 83—193 **13 Claims**



1. A machine for trimming the open ends of containers comprising:

a. a table having an aperture therein;

b. spaced supports for said table;

c. a source of reciprocal power beneath the table and within the spaced supports;

d. a reciprocable platen between the table and the said power source;

e. an arm operatively interconnecting the power source to the platen;

f. a plurality of spaced cutting stations carried by the table and spaced from the center of said table.

g. a mount in each of the cutting stations;

h. bolt means threadably received with each of the mounts radially disposed with respect to the table aperture;

i. a vertically disposed cam plate swingably secured to each of the bolts;

j. a cam face on each of the cam plates;

k. a link operatively connected between each of the cam plates and the platen;

l. an upstanding block secured to the table at each cutting station between the said station and the table aperture;

m. a tool holder slidably received within each of the blocks and disposed in the path of each of the cam faces;

n. cutting blades carried by the tool holders extending into and above the table aperture;

o. a mandrel secured at one end to the table and extending upwardly from the said table to receive the container to be trimmed thereon;

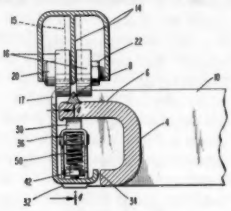
p. cam follower means cooperating with each of the tool holders and driven by the cam faces to move the cutting blades into cutting engagement with the container; and

q. means carried by the cam plates to retract the cutting blades following said cutting engagement.

4,257,294
APPARATUS FOR SEVERING SHEET MATERIAL

F. Raymond Stoveken, East Windsor, N.J., assignor to Marcal Paper Mills, Inc., Elmwood Park, N.J.

Filed Dec. 28, 1978, Ser. No. 973,883
Int. Cl.[3] B26D *1/02, 1/20, 7/04*
U.S. Cl. 83—374 8 Claims

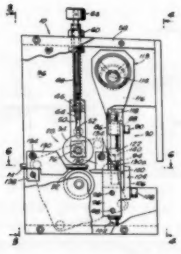


1. Apparatus for severing sheet material comprising guide rail means, carriage means including means mounting said carriage means on said guide rail means, a cutter bar supported on said guide rail means, said cutter bar having opposite flat surfaces extending longitudinally of said rail means, said carriage means including a dual set of rollers, one of said rollers having a sharp edge in engagement with said flat surface of said cutter bar and the other of said dual rollers having an edge in engagement with an opposed flat face of said cutter bar, a pressure roller on said carriage means engaging said rail means to clamp said dual set of rollers against said cutter bar while allowing said carriage means to advance longitudinally along said rail means, said carriage means including a frame, said frame including a flange overlapping said rail means, and a lever arm on said carriage means between said flange and said rail means, said pressure roller being mounted on said lever arm, and adjustment means between said lever arm and said flange for adjusting the position of said pressure roller relative to said dual rollers.

4,257,295
MULTIPLE PURPOSE CUTTER APPARATUS

Jayantilal S. Patel, El Monte, Calif., assignor to Eubanks Engineering Co., Monrovia, Calif.

Filed Feb. 26, 1979, Ser. No. 14,933
Int. Cl.[3] B26D *1/08*
U.S. Cl. 83—374 2 Claims



1. Apparatus for cutting lengths of elongated materials, comprising:

a main frame structure;

a pair of drivingly interconnected rotatable feed rollers positioned in a material feeding path;

a head frame member supported on said main frame for rectilinear movements towards and away from said feed path;

cutting means including a cutting blade rigidly connected with said head frame member;

means for moving the head frame member towards the feeding path to effect a cutting operation of material on the discharge side of said feed rollers;

means including a resiliently mounted presser member carried by said head frame member extending across the material feed path for engaging and holding the material during a cutting operation, and being positioned to engage the material in advance of the cutting blade and between the cutting blade and said feed rolls;

laterally spaced guide rods which coact to slidably support the head frame member and the presser member;

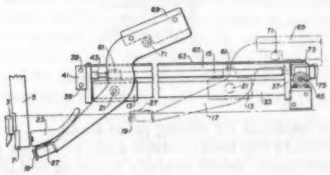
means interconnecting the head frame member and presser member for relative movement on said guide rods to a limit position of separation, but permitting movement towards each other; and

spring means urging the head frame member and presser member towards said limit position.

4,257,296
SHEAR BACK-GAUGING SYSTEM

Wilbur G. Short, Browns, Ill., assignor to Canron Corp., Oakland, Calif.

Filed Apr. 5, 1976, Ser. No. 673,873
Int. Cl.[3] B26D *7/01*
U.S. Cl. 83—393 6 Claims

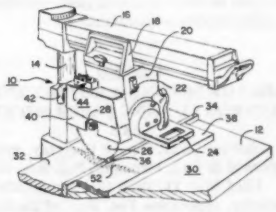


1. A back-gauge assembly for a shear machine having a reciprocally supported ram assembly with a shear knife affixed thereto for performing an operation on work, and a pair of side housings characterized by means carried on said side housings in a plane parallel to and above such work for horizontal adjustment of said back-gauge assembly.

4,257,297
CIRCULAR SAW WITH VISUAL CUT LINE INDICATOR

Peter Nidbella, 436 Morrow Ave., Carnegie, Pa.

Filed Jan. 31, 1979, Ser. No. 8,031
Int. Cl.[3] B27B *5/20, 5/29*
U.S. Cl. 83—471.3 14 Claims



1. A power saw of the type having a circular saw blade rotatable about an axis perpendicular to the plane of the blade's surface and movable relative to a stationary workpiece to achieve a cutting action on the workpiece, light means mounted on the machine adjacent to the blade and in a location generally away from the workpiece whereby the blade is

interposed generally between the light means and the workpiece, and the light means being oriented to cast light rays toward the workpiece such that a shadow of the blade will be discernible on the workpiece to indicate to the saw's operator the intended line of cut of the saw blade when the blade is advanced to perform its cutting action on the workpiece.

4,257,298

APPARATUS FOR CUTTING PAPER SHEETS OR THE LIKE

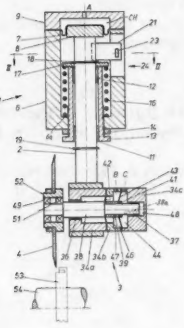
Kurt Aykut, Hamburg, Fed. Rep. of Germany, assignor to E. C. H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed May 11, 1979, Ser. No. 38,058

Claims priority, application Fed. Rep. of Germany, May 19, 1978, 2821957

Int. Cl.³ B23D *19/04*; B26D *1/24*

U.S. Cl. 83—482 **10 Claims**



1. In an apparatus for cutting paper sheets or the like, the combination of a first knife rotatable about a first axis; a second rotary knife; carrier means rotatably mounting said first knife; means for moving said first knife transversely of said axis toward and away from said second knife including a guide member connected with said carrier means and turnable between a plurality of positions about a second axis which is substantially normal to said first axis, and means for reciprocating said guide member in the direction of said second axis; and orienting means for maintaining said guide member in a selected one of said plurality of positions, including first abutment means turnable with said guide member about said second axis, means for continuously applying torque to said guide member and to said first abutment means in a direction to turn said guide member about said second axis, second abutment means located in the path of movement of said first abutment means under the action of said torque applying means, and means for adjusting the position of at least one of said abutment means with reference to the other of said abutment means to thereby effect the movement of said guide member from one to another of said plurality of positions.

4,257,299

MEANS FOR MOVING A ROTARY KNIFE IN APPARATUS FOR CUTTING PAPER SHEETS OR THE LIKE

Kurt Aykut, Hamburg, Fed. Rep. of Germany, assignor to E. C. H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

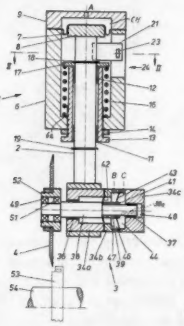
Filed May 11, 1979, Ser. No. 38,059

Claims priority, application Fed. Rep. of Germany, May 19, 1978, 2821956

Int. Cl.³ B23D *19/04*

U.S. Cl. 83—482 **10 Claims**

1. In an apparatus for cutting paper sheets or the like, the combination of a first rotary knife; carrier means for said first knife; a rotary second knife; a first fluid-operated motor actuatable to move said carrier means with respect to said second knife substantially at right angles to the axis of said first knife to a predetermined end position; a second fluid-operated motor actuatable to move said first knife with respect to said carrier means substantially in the axial direction of said first knife; and control means for actuating said motors, including a source of pressurized fluid, first conduit means connecting said source with said first motor, second conduit means connected in parallel with said first conduit means and connecting said



source with said second motor, valve means installed in said first conduit means and operable to admit pressurized fluid to said first motor whereby the pressure in said first conduit means rises when said carrier means assumes said end position, and a threshold member installed in said second conduit means and operable to permit pressurized fluid to flow from said source to said second motor when the pressure in said first conduit means rises to a predetermined value.

4,257,300

APPARATUS FOR DEFACING PAPER MONEY AND SIMILAR SECURITIES

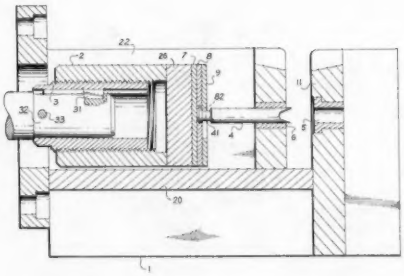
Vladimir Muzik, Nepomuk, Czechoslovakia, assignor to Statni banka ceskoslovenska, Prague, Czechoslovakia

Filed Sep. 1, 1978, Ser. No. 938,949

Claims priority, application Czechoslovakia, Sep. 1, 1977, 5703/77

Int. Cl.³ B26F *1/14*

U.S. Cl. 83—620 **2 Claims**



1. Apparatus for defacing paper money and similar securities, comprising a frame, a platen mounted on the frame and reciprocable with respect thereto, a transverse partition wall member on the frame forwardly of the platen and extending

normal to the direction of reciprocation of the platen for cooperation therewith, means for reciprocating the platen, at least one cylindrical punch tool secured to the platen and extending in the direction of reciprocation of the platen, a female die secured on the abutment partition wall member in alignment with the punch tool, means securing the punch tool to the platen, the forward active end of the punch tool being provided with a twin cutting edge of parabolic shape, both of said cutting edges of the tool being separated by a channel with a semicircular bottom, the ratio of the axial depth of the channel and of the diameter of the punch being substantially 0.54 to 1, and the ratio of the radius of the bottom part of the channel and of the diameter of the cylindrical punch being substantially 0.3 to 1, and comprising a supporting plate, a safety plate, and a return stroke plate disposed in stacked relationship and secured to the platen in that order with the supporting plate abutting the platen, the return stroke plate being provided with a number of keyhole slots, each of the punch tools being provided on the end thereof adjacent the platen with a flange and an annular groove forwardly of the flange, when operatively mounted upon the platen each of the punch tools having the flanged rear end thereof received in an aperture in the safety plate and the grooved portion of the punch tool received within the narrower portion of the keyhole slot in the return stroke plate, and comprising means for securing the supporting plate, the safety plate, and the return stroke plate together and to the platen.

4,257,301

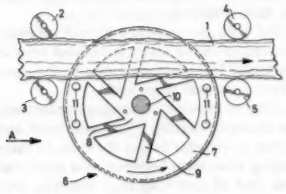
CIRCULAR SAW BLADE

Jorma Tuomaala, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarku, Finland

Continuation-in-part of Ser. No. 911,834, Jun. 2, 1978, abandoned. This application Jul. 27, 1979, Ser. No. 61,289

Int. Cl.³ B27B *33/08*

U.S. Cl. 83—835 **5 Claims**



1. A circular saw blade comprising a toothed annular peripheral portion and an interior portion, strips connecting said toothed annular peripheral portion to said interior portion, wherein the width of the peripheral portion is 10–30% of the diameter of the blade, said strips having a flexible portion, the length of the flexible portion of the strips is at least 10% of the diameter of the blade, wherein the flexibility K is defined by the formula $K=(L/B)\times(\sin \alpha/N)$ in which L=the length of the center line of the flexible portion of the strip and B=the greatest width of the strip of this length, α=the angle between the radius running through the center point of the flexible portion and the tangent of the center line through the intersection point of the radius and the center line, N=the number of strips and K is greater than $\frac{1}{4}$.

4,257,302

SAW TOOL

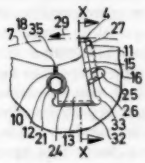
Eberhard Heimbrand, Horb, Fed. Rep. of Germany, assignor to Ledermann & Co., Horb, Fed. Rep. of Germany

Continuation of Ser. No. 519,122, Oct. 30, 1974, abandoned. This application Feb. 8, 1978, Ser. No. 875,993

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1973, 2354481

Int. Cl.³ B27B *33/12*

U.S. Cl. 83—839 **6 Claims**



1. A saw tool for making a saw cut, the saw tool comprising: a tool support with a plurality of recesses distributed in spaced relation with one another along the periphery of the tool support, each recess being defined by a pair of clamping surfaces; a cutting blade disposed in each recess between the pair of clamping surfaces; an eccentric in each recess, the eccentric having a surface with a first radius of curvature and being rotatable about an axis normal to the radius of curvature; an intermediate member disposed in each recess between the eccentric and the cutting blade for holding the cutting blade against one of the clamping surfaces of the recess, said intermediate member being spaced from the bottom of said recess, the intermediate member having a first surface abutting the cutting blade and a second surface abutting the eccentric wherein the second surface has a radius of curvature substantially greater than the radius of curvature of the eccentric thereby establishing line contact between the second surface of the intermediate member and eccentric along a line normal to the line of the saw cut, whereby the intermediate member rocks about the line as the saw tool cuts.

4,257,303

ELECTRONIC MUSICAL INSTRUMENT OF PARTIALS SYNTHESIS TYPE

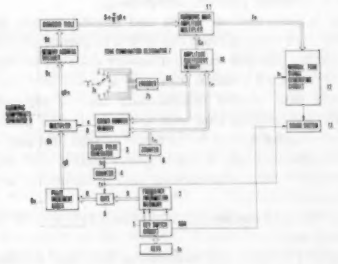
Yohei Nagai, and Shimaji Okamoto, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 30, 1979, Ser. No. 61,742

Claims priority, application Japan, Jul. 31, 1978, 53/93458

Int. Cl.³ G10H *1/10, 7/00*

U.S. Cl. 84—1.22 **3 Claims**



1. An electronic musical instrument of a partials synthesis type comprising:

means for generating a frequency number signal corresponding to a tone pitch assigned to a depressed key;

a tone combination designator for producing a tone designation signal selectively designating one of a plurality of tone combinations to be produced, each said tone combination including at least two tone colors;

an order number memory device including a plurality of tone combination memory areas selectable by said tone designation signal, each said area including at least two memory sections respectively corresponding to said tone colors, each said section being adapted to store order number information corresponding to the number of orders of partials required to synthesize each of said tone colors and to output information from a memory area addressed by said tone designation signal;

an amplitude coefficient memory device adapted to store amplitude coefficients of partials corresponding to respective ones of said order numbers and to output coefficients selected by said tone designation signal;

means responsive to said frequency number signal and to said order number information for producing a plurality of tone partial waves having instantaneous wave values;

first multiplying means for multiplying said instantaneous wave values with corresponding coefficient outputs of said amplitude coefficient memory device; and

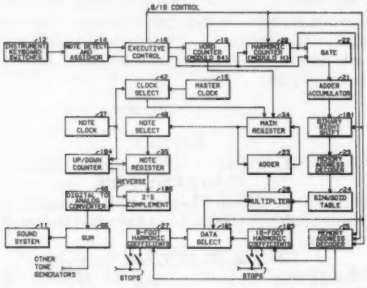
means for synthesizing multiplication products produced by said first multiplying means.

4,257,304

SIMULTANEOUS VOICE PITCHES IN A POLYPHONIC TONE SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Aug. 9, 1979, Ser. No. 65,312
Int. Cl.³ G10H *1/06*
U.S. Cl. 84—1.23 **29 Claims**



1. A musical instrument for simultaneously producing musical tones at different pitches, comprising;

a means for computing a first and second master data set during each computation cycle of a sequence of computation cycles wherein said first master data set corresponds to a preselected musical tone at a selected first pitch and wherein said second master data set corresponds to a preselected musical tone at a selected second pitch,

a data combining means for combining said first and second master data sets into a combination master data set,

a first memory means for storing said combination set to be thereafter read out,

a second memory means for storing input data to be thereafter read out,

data transfer means for addressing out said combination master data set from said first memory means and for writing said addressed out combination master data set in said second memory means,

a means for producing musical waveshapes from data read out from said second memory means, and

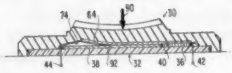
a memory addressing means for addressing said second memory means in a first direction to read out said combination master data set in a first order and then for addressing said second memory means in a second direction to read out said combination master data set in a second order opposite to said first order wherein said read out combination master data set values are provided to said means for producing musical waveshapes thereby simultaneously producing said musical tones at different pitches.

4,257,305

PRESSURE SENSITIVE CONTROLLER FOR ELECTRONIC MUSICAL INSTRUMENTS

David Friend, Boston, and Royce C. Kahler, Jr., Weston, both of Mass., assignors to ARP Instruments, Inc., Lexington, Mass.

Filed Dec. 23, 1977, Ser. No. 863,874
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.24 **8 Claims**



1. An electromechanical transducer for an electronic musical instrument comprising

A. means forming a first electrical contact,

B. an elongated resistance element adjacent to, but spaced from, said contact,

C. a resilient mounting element (a) having elongated tapered channels at opoosed sides thereof and of a depth increasing from a remote end of said resistance element to a near end thereof for providing increasing yield at positions corresponding to increasing depth in said channels, and (b) including means forming a force-receiving surface on one face thereof and a concave curved surface on an opposed face thereof accommodating a deformable, elongated conductive strip thereon, said strip being electrically connected at one end thereof to said first electrical contact, said strip being

(1) aligned with and opposed to said resistance element,

(2) mounted to curve away from said resistance element increasingly from said near end in the absence of exterior forces on said strip, and

(3) mounted to provide increasing contact with said resistance element starting from said near end thereof in response to exterior forces thereon, to thereby provide a varying resistance between said first contact and the remote end of said resistance element, and said force-receiving surface being elongated with said strip such that the minimum resistance achievable between said first contact and said remote end of said resistance element can be varied by varying the location of the exterior force applied to said force-receiving surface.

4,257,306

ELECTRONIC DISPLAY DEVICE FOR FRETTED STRINGED INSTRUMENTS

Daniel Laflamme, 2748 Ohara La., Cresent Beach, British Columbia, Canada

Filed Jan. 23, 1978, Ser. No. 871,173
Int. Cl.³ G10G *1/02*; G09B *15/02*
U.S. Cl. 84—485 R **13 Claims**

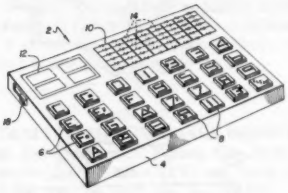
1. An electronic device for visually illustrating the finger

positions necessary to produce a selected cord in a selected key on a stringed, fretted musical instrument, said device comprising:

(a) a frame structure including a display means for visually representing the strings and frets of a stringed, fretted musical instrument, said display means having at least two display ranges respectively corresponding to different fret ranges on the instrument;

(b) indicator means for identifying the instrument frets visually represented in each said display range;

(c) illuminating means for illuminating areas of each said display range in accordance with the various finger positions on the instrument strings relative to the instrument frets;



(d) a plurality of key selector switches connected to said indicator means and respectively representing various musical keys such that the actuation of said key selector switches causes said indicator means to indicate for each said display range the particular instrument frets used in conjunction with selected musical keys; and

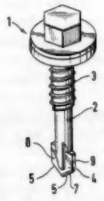
(e) a plurality of musical interval selector switches connected to said illuminating means and respectively representing various musical intervals such that the actuation of said musical interval selector switches causes said illuminating means to simultaneously illuminate predetermined areas in each said display range in order to provide visual representations of the particular instrument finger positions corresponding to selected musical intervals.

4,257,307

HOLE-DRILLING SELF-TAPPING SCREW

Werner Regensburger, Widnau, Switzerland, assignor to SFS Stadler AG, Mauren, Liechtenstein

Filed Jan. 17, 1978, Ser. No. 870,194
Claims priority, application Austria, Jan. 19, 1977, 304/77
Int. Cl.³ F16B *25/00*
U.S. Cl. 411—387 **15 Claims**



1. A hole-drilling, self-tapping screw comprising:

(a) an elongated, threaded rod-like metallic shank member having a longitudinal axis;

(b) driving means on one axial end portion of said shank member for turning the shank member about said axis,

(1) the other axial end portion of said shank member being formed with an axially extending slot open at the end and along both sides of said shank member; and

(c) a flat plate-like cutting member of a metallic material harder than the material of said shank member,

(1) a portion of said cutting member being fixedly secured in said slot,

(2) said cutting member projecting axially from said slot away from said other axial end portion and defining a surface of circular cross section as said shank member is turned about said axis,

(3) the maximum diameter of said surface being smaller than the maximum major diameter of the threads on said shank, and

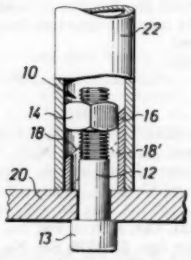
(4) said cutting member having two wide axially extending faces and two narrow axially extending faces extending between said wide faces, the end of said cutting member spaced outwardly from said slot forming an arrow head-like cutting edge comprising a pair of straight sections each converging inwardly toward the other from a different one of said narrow faces with each said straight section forming an oblique angle with the prolongation of the longitudinal axis of said shank member, said straight sections intersecting at a line extending between said wide faces, and a groove in at least one of said wide faces extending along one of said straight sections of said cutting edge, said groove having a pair of edges disposed in generally parallel relation with one edge extending along said straight section and the other edge spaced from said one edge and extending across said wide face and said shank member within the region of said slot being deformed into mechanical interconnection with said cutting member.

4,257,308

ANCHORING DEVICE FOR AN OPENING, E.G. A TUBE END

Stellan Örnberg, Klintvägen 3, 522 59 Jönköping, Sweden

Filed Jan. 11, 1979, Ser. No. 2,589
Claims priority, application Sweden, Oct. 20, 1978, 7800732
Int. Cl.³ F16B *13/04*; A47B *91/06*; B60B *33/00*
U.S. Cl. 411—354 **9 Claims**

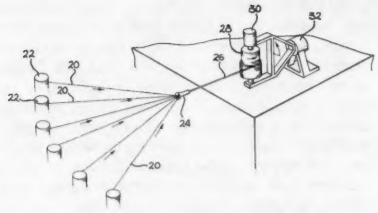


1. A radially expansible anchoring device of the kind including a screw or bolt and an internally threaded locking body insertable in a walled opening for fixing the screw or bolt in such opening, wherein the improvement comprises a tubular sleeve receivable in the opening, said locking body having an end suface substantially perpendicular to its longitudinal axis and facing said sleeve, said sleeve having an end surface facing said locking body substantially perpendicular end surface and inclined with respect thereto, said substantially perpendicular end surface of said locking body engaging at one edge thereof against said inclined end surface of said sleeve, such that said locking body is securely wedged between a portion of said inclined end surface of said sleeve and an opposing portion of the wall of the opening by tightening of the screw or bolt to cause the body to be drawn toward the mouth of said opening.

4,257,309
CONTINUOUS FILAMENT ROPE AND METHOD OF MAKING SAME

Edmond A. Dunahoo, Long Beach, Calif., assignor to Fiber Science, Inc., Utah, Calif.

Filed Oct. 23, 1978, Ser. No. 953,864
Int. Cl.³ D04G *1/00*; D04D *1/00*; D07B *1/02, 1/22*
U.S. Cl. 87—12 **34 Claims**



1. A method of making rope-like structures comprising the steps of:
(a) providing a plurality of filaments in a continuous strand;
(b) twisting the strand about its axis through a predetermined angle per unit length to form a twine;
(c) winding the twine to provide a loop having a substantial number of turns of the twine, and
(d) twisting the loop provided in step (c) about its axis in a direction opposite the direction of twist provided in step (b) to form the rope-like structure having loops at each end thereof.

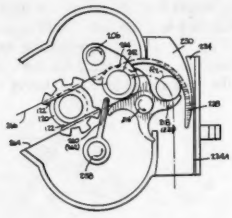
14. A method of making rope-like structures comprising the steps of:
(a) providing a plurality of synthetic filaments in a continuous strand;
(b) twisting the strand about its axis through a predetermined angle per unit length to form a twine;
(c) wet winding the twine with an uncured resin to provide a loop having a substantial number of turns of the twine;
(d) twisting the loop provided in step (c) about its axis in a direction opposite the direction of twist provided in step (b) to form the rope-like structure having loops at each end thereof, and
(e) curing the resin.

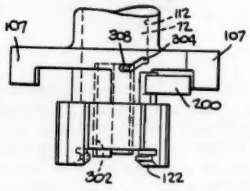
4,257,310
AMMUNITION FEEDING MECHANISM FOR A GUN

Lawrence R. Folsom, Schenectady, N.Y.; Victor R. Gardy, Shelburne, and August J. Haberstroh, Highgate, both of Vt., assignors to General Electric Company, Burlington, Vt.

Division of Ser. No. 533,160, Dec. 16, 1974, which is a division of Ser. No. 403,121, Oct. 3, 1973, Pat. No. 3,915,058. This application Apr. 23, 1979, Ser. No. 32,587
Int. Cl.³ F41D *10/06*
U.S. Cl. 89—33 CA **4 Claims**

1. A gun for firing a round of ammunition comprising
a housing;
a gun barrel having a longitudinal axis, disposed within said housing, and journaled for reciprocation along said longitudinal axis with respect to said housing;
a gun bolt disposed within said housing and journaled for reciprocation along said longitudinal axis;
an operating mechanism for said gun bolt comprising
a forward rotating means journaled for rotation about said gun barrel longitudinal axis,
an aft rotating means spaced from said forward rotating means by at least the length of a round of ammunition and journaled for rotation about said gun barrel longitudinal axis,
power transmission means driven by said forward rotating means and driving said aft rotating means,
first coupling means interengaging said gun barrel and said forward rotating means so that rectilinear aftward movement of said gun barrel causes rotation of said aft rotating means, and
second coupling means interengaging said gun bolt and one of said rotating means so that rotation of said one rotating means causes rectilinear aftward movement of said gun bolt;



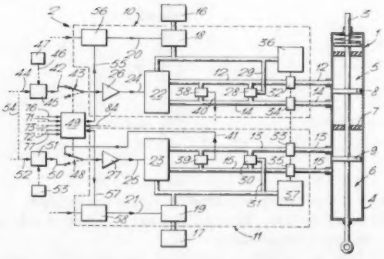


means for feeding rounds of ammunition to and from said gun bolt; and
third coupling means interengaging said operating means and said feeding means so that said operating means drives said feeding means.

4,257,311
CONTROL SYSTEMS

Michael P. Barnsley; Edward S. Eccles, both of Cheltenham, England, and Ralph Taylor, Bellevue, Wash., assignors to Smiths Industries Limited, London, England

Filed May 29, 1979, Ser. No. 43,862
Claims priority, application United Kingdom, May 30, 1978, 24018/78
Int. Cl.³ F15B *9/03, 9/09, 13/06*
U.S. Cl. 91—363 A **10 Claims**



1. A control system of the kind for controlling, in response to control signals, the force applied to actuator means, so as thereby to produce a corresponding controlled displacement of said actuator means, the system including first and second circuits both of said circuits being capable of supplying signals

to control said force, the improvement wherein said system includes: means for supplying first control signals to said first circuit, the said first circuit deriving first signals in accordance with said first control signals to control a major part of said force applied to said actuator; means for supplying second control signals, nominally-identical to said first control signals; means for deriving third control signals in accordance with the said force controlled by said first signals; means for supplying said third control signals to said second circuit, the said second circuit deriving second signals in accordance with said third control signals to control force applied to said actuator means at a level just sufficient to reduce the effect of resistance to displacement of the actuator means; and a control unit, the said control unit including means responsive to malfunction of said first circuit or error in said first control signals that effects switching of said second circuit from said third control signals to said second control signals such that, upon detection of said malfunction or error, said second signals control a major part of force applied to said actuator means.

4,257,312

TANDEM DIAPHRAGM BRAKE BOOSTER

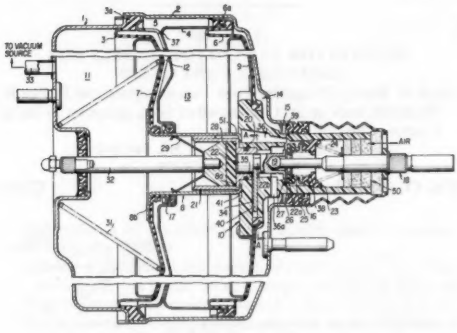
Atsushi Ohmi, Anjo, and Yoichi Furuta, Gifu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Nov. 14, 1978, Ser. No. 960,626

Claims priority, application Japan, Nov. 14, 1977, 52-152435[U]

Int. Cl.[3] **F15B** *9/10;* **F01B** *19/00;* **F16J** *3/00*

U.S. Cl. 91—369 A **2 Claims**



1. A tandem diaphragm brake booster which comprises:

a housing;

first and second diaphragms disposed in said housing in spaced relation to each other;

a partition wall disposed between said first and second diaphragms within said housing for defining first, second, third and fourth chambers within said housing;

a securing member interconnecting said partition wall with said housing;

cylindrical means secured to said first diaphragm and axially slidable therewith, said cylindrical means being made of metal;

piston means secured to said second diaphragm and axially slidable therewith;

first fluid passage means provided in said cylindrical means for fluid communication between said first and third chambers, said first chamber being in communication with a vacuum source;

second fluid passage means provided in said securing member for fluid communication between said second and fourth chambers;

third fluid passage means provided in said piston means for fluid communication between said third and fourth chambers;

valve means disposed in said third fluid passage means for preventing fluid communication between said third and fourth chambers and introducing atmospheric pressure into said fourth chamber, thereby creating pressure differentials between said first and second chambers and said third and fourth chambers, respectively;

and operator-operated means for actuating said valve means in response to manual operation;

said valve means including a plunger operatively engaged with said operator-operated means and axially movable within said piston means;

a case member disposed in said cylindrical means and said piston means and receiving therein said plunger; and

a key member disposed in said piston means and extending radially into engagement with both said plunger and said case member to thereby retain said case member in said piston means and to limit axial movement of said plunger, one end of said cylindrical means extending radially inwardly and being disposed and retained between said case menber and said piston means, so as to connect said cylindrical means and said piston means by said key member wherein the other end of said cylindrical means extends radially outwardly and is secured to said first diaphragm.

4,257,313

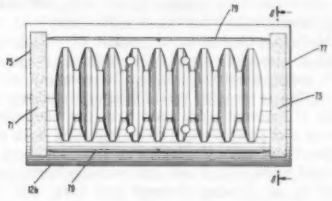
POWER STEERING PISTON AND CYLINDER COMBINATION WITH PLASTIC WEAR SURFACES

Peter H. Sheppard, 101 Philadelphia St., Hanover, Pa. 17331

Continuation-in-part of Ser. No. 843,976, Oct. 20, 1977, abandoned. This application Apr. 30, 1979, Ser. No. 34,562

Int. Cl.[3] **F15B** *13/04;* **F01B** *9/00, 31/00;* **F16J** *9/00*

U.S. Cl. 91—422 **12 Claims**



1. In a power steering gear having a reciprocating power piston in the cylinder, a valve operatively connected to said piston by distribution means to selectively distribute pressurized fluid to a first and second end of the piston within the cylinder for steering action, a steering input shaft operatively engaging the valve, inlet fluid pressure means on one side of said piston for supplying hydraulic fluid under operating pressure to said gear, and an output rack formed on the other side of said piston and engaging an output gear, the improvement comprising:

recess means formed on said piston, said recess means including an arcuate groove adjacent each end of said rack and extending around only on said other side of said piston, each groove being defined by a bottom, two sides and two ends; and

plastic bearing strip means disposed and confined within and substantially filling each arcuate groove, the outer peripheral face of said plastic bearing means forming a low molecular bearing surface at the sliding interface, passage means for conveying hydraulic fluid to said grooves to provide a layer of hydraulic fluid disposed beneath each of said bearing strip means and confined by the bottom, two sides and two ends of the groove, the fluid under each bearing being at substantially equal pressures to maintain the ends of the piston balanced, whereby the bearing strip means floats on said fluid layer to counter the force of said inlet fluid pressure means and whereby the efficiency of translation of said piston in said cylinder is thereby enhanced.

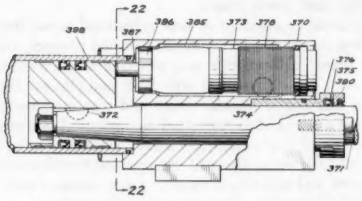
4,257,314
APPARATUS FOR IMPROVED MOTION CONTROL

Richard E. Deschner, 5550 Harcross Dr., Los Angeles, Calif. 90043

Division of Ser. No. 783,006, Mar. 30, 1977, abandoned. This application Oct. 24, 1978, Ser. No. 954,102

Int. Cl.³ F01B *11/02, 31/12*

U.S. Cl. 92—5 R **11 Claims**



1. An automatically cooled control device for use with a reciprocative entity having a stroke range, said entity comprising a cylinder of a reciprocative pneumatic actuator, and a piston slidably disposed in said cylinder, means for introducing air under pressure into the cylinder for actuation of the piston, said device comprising the combination of a structure supporting a self-contained hydraulic cartridge, said structure being provided with a bore retaining said cartridge with clearance therearound for air flow, said cartridge comprising; a longitudinal body supporting a closed body of hydraulic fluid within an enclosure, a reciprocative fluid damped plunger extending partly within said fluid and limited in speed of movement thereby, a portion of the plunger length being extrudable from said longitudinal body by pressure within said fluid, a flexible tubular bladder surrounding a portion of said longitudinal body with the interior of said bladder forming a part of said enclosure, and resilient means adapted to constrict said bladder to create sufficient pressure in said fluid to extrude said plunger when free of external loads, said structure having inlet and outlet ports and passageways communicating with said bore and the interior of said cylinder for air flow, said bore forming a part of said passageways and said cartridge being adapted to be cooled by air flowing through said bore, said structure being adapted to be secured in a location relative to said entity so that said fluid damped plunger protrudes within an end portion of said entity stroke range and is actuated through a working stroke by contact with a portion of said entity whenever said entity approaches an end of its stroke range, said plunger thereby controlling the speed of movement of said entity, said inlet port being adapted for connection to a source of compressed air for operating said pneumatic actuator while simultaneously cooling said cartridge.

4,257,315
ASSEMBLY WITH RELATIVELY DISPLACEABLE MEMBERS

Claes-Gustav E. Y. Tisell, Strangnas; Karl E. B. Lundell, Bromma; Sven H. N. Horner, Eskilstuna; Gustav Y. Thorstensson, and Gustav S. E. Karlstedt, both of Sollentuna, all of Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

Continuation of Ser. No. 721,220, Sep. 8, 1976, which is a continuation of Ser. No. 534,812, Dec. 20, 1974, abandoned. This application Dec. 11, 1979, Ser. No. 102,328

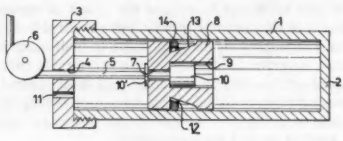
Claims priority, application Sweden, Dec. 21, 1973, 17345/73

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.³ F15B *15/26*

U.S. Cl. 92—26 **10 Claims**

1. An assembly comprising an inner and an outer cylindrical member, respectively, the inner member being relatively axially displaceable along the inner peripheral surface of the outer member, means for axially displacing said inner member relatively to said outer member, the inner member being provided with an annular peripheral recess, a resilient split ring being lodged in the recess fully retractable into same but elastically biased in radial direction toward the inner peripheral surface of the outer member, the recess having a first flank and a second flank, the first flank lying in a radial plane of the inner member, the second flank extending in a plane oblique to the longitudinal center line of the inner member, forming an angle with the longitudinal center line of the inner member that is less than 30°, the first flank bearing equatorily on the ring upon axial



displacement of the inner member relative to the outer member in a first direction, and, upon axial displacement of the inner member relative to the outer member in a direction opposite the first direction, said ring being displaced from bearing upon said first flank and being moved along said second flank such that the second flank applies to the ring a substantially radial outward jamming pressure toward the inner peripheral surface of the outer member whereby the ring is jammed like a wedge and locks the inner member against axial displacement in any direction.

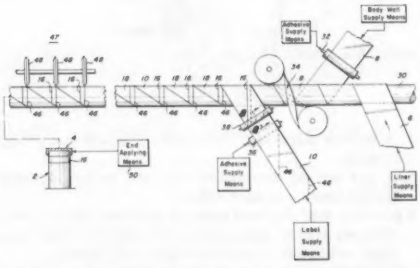
4,257,316
METHOD FOR PRE-CUTTING LABELS FOR COMPOSITE CONTAINERS

Hugh H. Roder, Bridgeton; Elroy Denningmann, and Dewey B. Thornhill, both of St. Charles, all of Mo., assignors to Boise Cascade Corporation, Boise, Id.

Filed Sep. 20, 1978, Ser. No. 944,141

Int. Cl.³ B31C *3/02*

U.S. Cl. 493—68 **1 Claim**



1. In a method of manufacturing a composite container for dough products and the like, including the steps of helically winding on a mandrel an impervious inner liner layer strip; helically winding a fibrous body wall layer strip in the same sense as, and in adhesively bonded relation on the external surface of, said helically-wound inner liner layer, thereby to define a body wall layer containing a helical unbonded butt joint, said liner layer including a helically extending expansible folded portion bonded to said body wall layer on both sides of, and extending in straddling relation across, said helical butt joint; helically winding a label layer strip in adhesively-bonded relation on the external surface of said body wall layer, thereby to form a tubular laminate, said label layer being wound in edge-overlapping relation with one edge portion being exposed; transversely cutting the tubular laminate along longitudinally spaced lines of circumferential end cuts contained in planes normal to the longitudinal axis of the tubular laminate, thereby to define a plurality of cylindrical laminate sections;

and securing to one end of the laminate section a metal end closure member,

the improvement which comprises

forming a plurality of longitudinally spaced parallel collar-defining scorelines in the label layer strip prior to the winding of said strip on the external surface of said body wall layer, said collar-defining scorelines extending continuously between said one edge of said label layer strip and the opposite edge of said label layer strip, said collar-defining scorelines further extending circumferentially about the resulting tubular laminate section, each of said collar-defining scorelines further defining a pull tab portion between said scoreline and said label layer one edge, whereby upon pulling of the tab portion of the label layer, the label layer is torn from the container assembly along the circumferential collar-defining scoreline adjacent the metal end closure member.

4,257,317

METHOD OF MANUFACTURING PAPER CONTAINERS

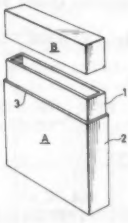
Tetsuo Yoshida; Toshiyuki Ogura; Shinji Tajiri, and Toshio Sata, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 6, 1979, Ser. No. 27,701

Claims priority, application Japan, Apr. 17, 1978, 53/45062

Int. Cl.³ B31B *7/14*

U.S. Cl. 93—40 **6 Claims**



1. A method of manufacturing a shaped paper container, comprising the steps of:

forming a parallelepiped inner body in the form of a box having no top panel from a single first blank sheet of corrugated board or card board,

forming an outer body by packaging said inner body within a single second blank sheet in such a manner that said outer body is in close contact with the outside of said inner body, and

providing a continuous cut in said outer packaging body to divide said outer packaging body into an upper part and a lower part so that said upper part of said outer packaging body can be detachably mounted on said inner packaging body.

4,257,318

VARIABLE DEAD BAND PRESSURE CONTROL SYSTEM

James R. Johannsen, Minnetonka, Minn., assignor to McQuay-Perfex Inc., Minneapolis, Minn.

Filed Apr. 30, 1979, Ser. No. 34,869

Int. Cl.³ B64D *13/00*

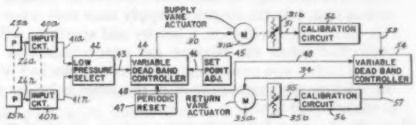
U.S. Cl. 98—1.5 **17 Claims**

1. A pressure control system for an air distribution system, including an air supply blower and an actuator for varying the air flow of the blower, comprising:

means for sensing pressure at a plurality of points within said distribution system;

adjustable means for selecting a desired operating pressure for the system;

comparison means for comparing the lowest of the sensed pressures and the selected pressure and for producing control signals for operating the actuator to control air flow in response thereto, said comparison means including means for establishing reference thresholds corresponding to pressures higher and lower than said selected pressure to define the dead band of the comparison means, and means for comparing said lowest sensed pressure to said reference thresholds for producing a first control signal to increase system pressure when said sensed pressure is lower than the low reference threshold, a second control signal to decrease system pressure when said lowest



sensed pressure is higher than said high reference threshold, and to produce neither of said first or second output signals when said lowest sensed pressure is between said high and low reference threshold; and

said comparison means including means for shifting at least one of said high and low reference thresholds to reduce the dead band of the comparison means when said first or second control signal is being produced, whereby the air flow in the system is adjusted to rebalance air flow and pressure to bring the lowest sensed pressure substantially within the narrowed dead band.

4,257,319

ROOM VENTILATING DEVICE

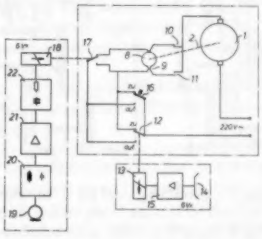
Eckhard Kucharczyk, Netphen, Fed. Rep. of Germany, assignor to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 902,854

Claims priority, application Fed. Rep. of Germany, May 9, 1977, 2720739

Int. Cl.³ F24F *7/00*

U.S. Cl. 98—37 **4 Claims**



1. Ventilating device for rooms having air passage apertures and closure means slidable between a closed position in which it is effective to block the apertures and an open position in which the apertures are unblocked, said ventilating device comprising:

(a) an electric drive for reciprocating the closure means between said open and closed positions,

(b) an electric supply main,

(c) a noxious gas sensor for producing an electrical signal when the noxious gas concentration in the room to be ventilated reaches a predetermined level,

(d) a first switch connected to the electrical drive,

(e) a second switch connected to the electrical drive,

(f) a cam operatively connected to the electric drive for simultaneous movement with said electric drive, said cam being effective to close the first switch and open the second switch when the closure means is at the closed posi-

tion and during movement of the closure means to the open position, and being effective to open the first switch and close the second switch when the closure means is at the open position and during movement of the closure means to the closed position,

(g) a primary relay connected to the noxious gas sensor for receiving said electrical signal, said relay having an inactive state in the absence of said electrical signal and an active state when receiving said electrical signal, said relay having a contact which is effective to connect the first switch to the electric supply main only when the relay is in said inactive state and effective to connect the second switch to the electrical supply main only when the relay is in said active state, whereby said apertures will be unblocked when the noxious gas concentration in the room reaches said predetermined level and blocked when the noxious gas concentration in the room is below said predetermined level,

(h) a sound sensor for producing a second electrical signal when the environmental sound reaches a predetermined volume, and

(i) electrical circuitry operatively connected to said primary relay and first and second switches and responsive to said second electrical signal for shifting said closure means from said open position to said closed position for a predetermined time period.

4,257,320

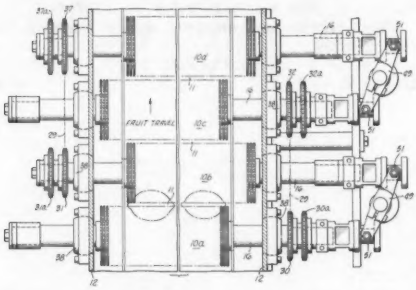
WHOLE FRUIT PEEL OIL EXTRACTOR

Franklin K. Holbrook, La Habra, and Ronald C. Bushman, Hacienda Heights, both of Calif., assignors to Brown International Corporation, Covina, Calif.

Filed May 14, 1979, Ser. No. 38,668

Int. Cl.³ A23N *1/00*; B26D *1/00*

U.S. Cl. 99—509 **15 Claims**



1. Apparatus for extracting peel oil from whole non-spherical citrus fruit such as lemons, comprising, in combination: a pair of parallel horizontal toothed rolls forming a bight therebetween for reception of fruit, means for turning said rolls in the same direction, and means for causing relative axial reciprocating movement of said rolls to change the orientation of the fruit with respect to the rolls.

4,257,321

PRESSES

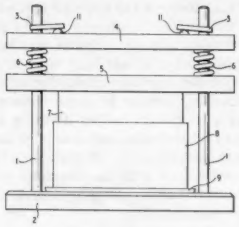
Rowland G. Wheeler, and Rodney Wheeler, both of Hoppins, Dunchideock, Exeter, Devon, England

Filed Jul. 23, 1979, Ser. No. 59,499

Int. Cl.³ B30B *15/06*

U.S. Cl. 100—219 **9 Claims**

1. A press comprising: a pressure assembly including at least one yoke, a base forming a reaction member, and guides projecting from said base along which said yoke is displaceable, the improvement comprising, at least one catch element slidable on and rockable relative to a respective said guide when assuming a first position in which said catch element jams against said guide and is held by friction against said guide, when a force is applied to said catch element by said yoke upon displacement of the yoke away from said base, said catch element thereby resisting said displacement of said yoke away



from said base, while permitting displacement of said yoke towards said base when assuming a second position, the said catch element contacting and bearing against a part of said yoke in at least the first said catch position.

4,257,322

REFUSE COMPACTOR

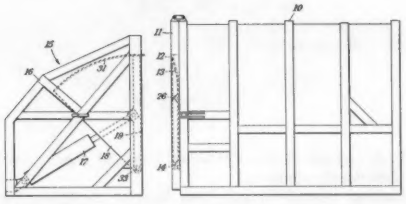
Robert H. McDermott, Chorley, England, assignor to Solid Waste Engineering Limited, Bolton, England

Filed Jun. 27, 1979, Ser. No. 52,470

Claims priority, application United Kingdom, Jun. 28, 1978, 29051/78

Int. Cl.³ B30B *7/00*

U.S. Cl. 100—229 A **9 Claims**



1. A refuse compactor comprising a refuse container open at one end for the receipt of refuse, a container door hinged on the container for pivotal movement between an open position for the insertion of refuse and a closed position in which the container door closes the open end of the container and compacts refuse in the container, a compactor unit releasably connected to the container and comprising drive means connected to the container door for moving the container door between the open and closed positions, and a door-locking drive-releasing mechanism which operates automatically to simultaneously lock the container door to the container in the closed position and release the drive means from the container door.

4,257,323

MULTI-PURPOSE PRINTING MACHINE

Serge Crasnianski, Meylan, France, assignor to Kis France, Grenoble, France

Filed Sep. 26, 1979, Ser. No. 79,099

Claims priority, application France, Oct. 5, 1978, 78 28494

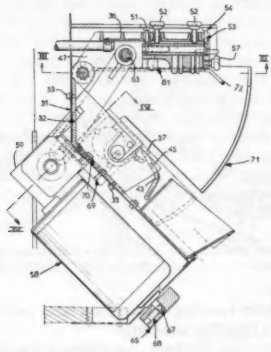
Int. Cl.³ B41F *17/00*

U.S. Cl. 101—41 **20 Claims**

1. In a printing machine which comprises a movable printing head and a support for the objects to be printed, the said head being designed for displacement and to come into contact with the object to be printed, the improvement wherein:

the movable head comprises a frame which pivots about an axis situated in a plane passing through the support and

fastened to the latter and which is connected to a motor-reduction gear unit driving through the medium of a system of connecting rods and cranks, the said frame carrying an electric heating plate, a first rapid attachment device which makes it possible to bring into thermal contact with the heating plate a printing unit adapted for the printing work which is to be done, and a second rapid



attachment device for placing in position accessories suitable for the work to be done, and

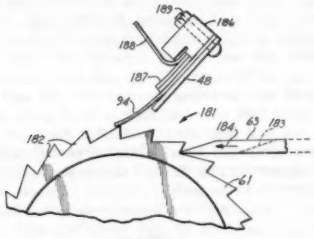
the support for objects to be printed comprises a frame fixed to the frame of the machine and adapted to receive different platens according to the type of object to be printed, the said frame of the support being provided with centring and holding means for the platen and means for removing the said platen.

4,257,324

POSITION MONITORING METHODS AND APPARATUS

Rafn Stefansson, San Marino, and Dwight G. Westover, Sierra Madre, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Oct. 30, 1978, Ser. No. 955,858
Int. Cl.³ B41J *1/44*
U.S. Cl. 101—93.01 **23 Claims**



1. A method of ascertaining the existence of a predetermined relative position between a ratchet member and a leaf spring, comprising in combination the steps of:

providing said ratchet member with ratchet teeth each having a projecting edge;

providing a transducer element emitting an electric signal in response to bending;

rendering said transducer element coextensive with part of said leaf spring;

applying said leaf spring to the ratchet member and effecting relative movement between the ratchet member and the leaf spring in order to realize said relative position and to cause the leaf spring to ride up on a tooth at a time and bend the partially coextensive transducer element and to snap back off the projecting edge of the tooth;

emitting with said transducer element an electric signal each time the bent transducer element snaps back after said leaf spring; and

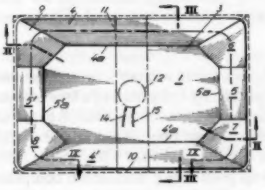
ascertaining from electric signals thus emitted an attainment of said relative position.

4,257,325

MOUTING OF A SUBSTANTIALLY PLANAR DIAPHRAGM DEFINING A SOUND TRANSDUCER

Jose J. Bertagni, Buenos Aires, Argentina

Filed Mar. 27, 1979, Ser. No. 24,456
Claims priority, application Argentina, Apr. 5, 1978, 271695
Int. Cl.³ G10K *13/00*; H04R *7/00*
U.S. Cl. 181—172 **10 Claims**



1. Mounting of a substantially planar diaphragm defining a sound transducer comprising:

a central body having a substantially planar front face and a rear face, a central portion of said rear face defining an impact receiving zone and a peripheral portion of said central body defining an edge which has at least first and second pairs of substantially parallel sides, the planes of the first pair of sides substantially forming right angles with the planes of the second pair of sides, each of said sides forming part of a polygon and being in substantially the same plane;

frame means for supporting said central body, said frame means being spaced from said sides of said central body; and

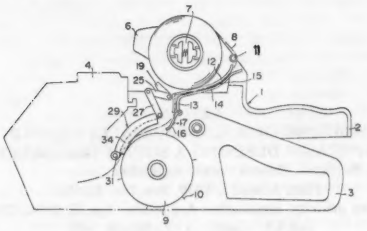
supporting means positioned in the space between said central body and said frame means for supporting said central body in said frame means in such manner that said front face of said central body is vibratable between parallel planes, said supporting means comprising first and second flexible supporting means, said first flexible supporting means comprising a plurality of first elements spaced apart from each other around the periphery of said central body; each of said first elements having a front face arranged between the front face and rear face of said central body, an outer edge contacting said frame means, an inner edge contacting one of said sides of said central body, and a pair of side edges; and said second flexible supporting means comprising a plurality of second elements located between said first elements of said first flexible supporting means, each of said second elements having an outer edge contacting said frame means, an inner edge contacting one of said sides of said central body, a pair of side edges adjacent respective side edges of said first elements, and a front face arranged between the front face and rear face of said central body in a different plane than the front faces of said first elements so that steps are defined between the front faces of said first and said second elements.

4,257,326

LABEL POSITIONING MECHANISM FOR A LABEL PRINTING MACHINE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan

Filed Oct. 16, 1978, Ser. No. 951,869
Int. Cl.³ B41K *3/48*
U.S. Cl. 101—288 **13 Claims**



1. A label strip positioning mechanism for use with a label printing machine, wherein said label printing machine comprises:

a machine body;

a feed wheel mounted rotatably in said machine body and having a periphery comprised of a label advancing surface which is engageable with the label strip for advancing the label strip in a preset direction as said feel wheel is rotated; means for rotating said feed wheel in the preset direction;

said label strip positioning mechanism comprising:

a label strip positioning member supported in said machine body and shaped to have a surface that cooperates with said feed wheel periphery, when said positioning member is at a first position close to said feed wheel periphery, to define a first clearance between said positioning member surface and said feed wheel periphery, said clearance having a spacing approximating the thickness of a label strip to be advanced by said feed wheel; said positioning member having a second position further from said feed wheel where a larger second clearance is defined between said feed wheel periphery and said positioning member surface;

an operating shaft rotatably mounted to said machine body; an arm mechanism having one portion fixed to said shaft and having a second portion, spaced from said first portion, and attached to said positioning member at a first loction on said positioning member; said positioning member being pivotally attached to said machine body at a second location on said positioning member which is spaced from said first location thereon, whereby said positioning member is pivoted between its said positions; said positioning member first location being upstream in the preset direction of rotation of said feed wheel from said positioning member second location;

said arm mechanism being movable by rotation of said shaft for moving said positioning member to said first position close to said feed wheel and for also moving said positioning member to said second position

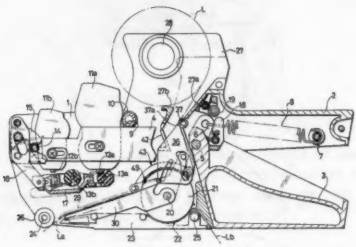
a pressure tongue which is spaced from and generally upstream of said positioning member surface with respect to said feed wheel preset direction when said positioning member is in said second position thereof and which is near to said feed wheel for defining an entrance for a label strip toward said feed wheel between said pressure tongue and said feed wheel; said pressure tongue being so shaped and extending near to said feed wheel as to guide a label strip in the preset direction and to generally obstruct movement of a label strip counter to the preset direction.

4,257,327

LABEL STRIP INSERTING DEVICE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan

Filed Apr. 23, 1979, Ser. No. 32,377
Claims priority, application Japan, Apr. 27, 1978, 53/55274[U]
Int. Cl.³ B41K *5/00*
U.S. Cl. 101—288 **7 Claims**



1. A label strip inserting device for a label printing machine for inserting a tape-like label strip:

said label printing machine comprising: a machine frame;

a platen pivotally secured to said machine frame; a printing head in opposition to said platen; means for moving said printing head and said platen together and apart to print a label on said platen;

a label strip feed wheel for feeding the label strip toward said platen;

said label strip inserting device comprising:

said platen;

an actuating member which has a first portion farther from said platen and that is pivotally connected to said machine frame and has a second portion pivotally connected to said platen;

a label depressing member which is pivotally connected to said actuating member remote from said first portion; said depressing member having a label depressing surface opposed to said feed wheel to press said tape-like label strip toward said label feed wheel; and

a link which is connected with said platen remote from the pivot connection of said platen to said machine frame; said link also being connected to said label depressing member remote from the connection between said depressing member and said actuating member, said platen being pivotable in a direction which moves both said actuating member and said link to separate said label depressing member, at the connection of said label depressing member with said actuating member and with said link, from said label feed wheel to form a label guide passage for inserting said label strip; said label guide passage when opened comprises a said label depressing surface of said label depressing member and said feed wheel, and further downstream in the path of insertion of labels, said platen.

4,257,328

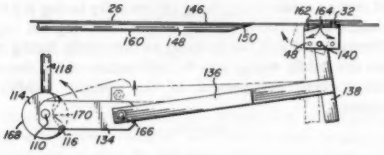
STRIP LABEL PRINTER

Stephan E. Gavit, 4832 W. Gill Pl., Denver, Colo. 80219

Filed May 18, 1979, Ser. No. 40,160
Int. Cl.³ B41K *3/48;* B41F *21/02, 1/28*
U.S. Cl. 101—292 **8 Claims**

1. The apparatus for imprinting labels one-at-a-time while detachably-fastened in longitudinally-spaced relation to the surface of a backing strip having at least one aperture in the space between adjacent labels comprising: an elongate flat bedplate having at least one slot extending longitudinally thereof; track-forming means disposed atop said bedplate adapted to receive the label strip and guide same along the slot so that one of the apertures therein remains in registry there-

with; a printing head mounted for movement upon actuation between an elevated inoperative position above the label strip and an operative position in indicia-forming contact therewith; a shuttle subassembly disposed beneath the slot in the bedplate for advancing the label strip and placing the labels one-at-a-time underneath the printing head, said assembly including a transversely-extending drive shaft, a crank arm mounted on said drive shaft for rotational movement therewith in a vertical plane paralleling the slot in the bedplate, a slide block having an upper surface disposed for sliding movement along the underside of the bedplate beneath the slot therein, said surface including an upstanding rib sized for guided movement along the bedplate slot and a fulcrum alongside said rib bearing against a portion of the bedplate adjacent said slot, said rib including an ear engageable within the registering aperture in the label strip effective to advance same upon forward movement of the slide block, and said fulcrum mounting said slide block for rockable movement between a rearwardly-tilted operative position wherein said ear is extended to engage the



label strip and a forwardly-tilted inoperative position wherein said ear is retracted beneath said label strip, and a rigid link having opposite ends pivotally connected to the crank arm and slide block at a point spaced from the fulcrum, said link being operative upon rotation of the crank to shuttle the slide block back and forth, said crank arm and link cooperating with one another and with the slide block to tilt the latter rearwardly when pushing it forwardly and to tilt same forwardly when pulling it rearwardly, and the pivotal connection between said link and slide block being so arranged relative to the fulcrum carried by the latter as to tilt same between its operative and inoperative positions when the direction of motion of said slide block reverses; and, cam means carried by said drive shaft for rotation therewith, said cam means being connected to said printing head and effective upon rotation to reciprocate same between its operative and inoperative positions, and said cam being oriented on said shaft in relation to the crank means so as to move the printing head into operative position during the return stroke of the shuttle subassembly when the slide block is inoperative.

4,257,329

FLUIDLESS MASTERS

Irving Panken; Robert S. Radow, and Brian J. Briddell, all of Dayton, Ohio, assignors to The Mazer Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 596,597, Jul. 17, 1975, abandoned. This application Aug. 16, 1976, Ser. No. 714,618

Int. Cl.³ B41M *5/02*

U.S. Cl. 101—473 **3 Claims**

1. A pre-printed duplicating master for producing printed copies with or without spirit duplicating fluids comprising a foundation sheet having a predetermined pattern of imaging material reverse printed directly thereon without the use of a transfer sheet, said imaging material comprising a heat-gelled non-fused vinyl resin having a microporous structure and having dispersed within the microporous structure an ink composition comprising a dye in a solvent, said ink composition being releasable from the microporous structure of said gelled resin and transferable in said predetermined pattern to a substrate on the application of pressure while said gelled resin is retained on said foundation sheet.

4,257,330

PROPELLING CHARGE FOR A RECOILLESS WEAPON OR A ROCKET AND A METHOD TO PRODUCE THE CHARGE

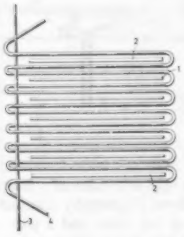
Gösta A. Andersson; Karl-Einar Lantz, and Rune V. Åkhagen, all of Eskilstuna, Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Jan. 16, 1979, Ser. No. 3,930

Claims priority, application Sweden, Jan. 18, 1978, 7800568

Int. Cl.³ F42B *1/00*

U.S. Cl. 102—100 **23 Claims**



1. A propelling charge comprising several rectangular powder strips for a recoilless weapon or a rocket, wherein the strips are piled on each other and joined with at least one joining thread at one side of the pile, and wherein the pile is bent into a tubular shape in such a manner that the edges of the strips, which are joined to each other, form an inner side of the tube.

4,257,331

TRACK SURFACING MACHINE

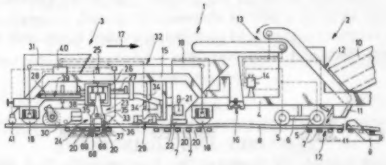
Josef Theurer, Vienna, and Friedrich Oellerer, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Aug. 24, 1978, Ser. No. 936,213

Claims priority, application Austria, Oct. 4, 1977, 7073/77

Int. Cl.³ E01B *27/10, 27/17*

U.S. Cl. 104—2 **8 Claims**



1. A mobile machine arrangement for surfacing a track resting on ballast, the track consisting of two rails fastened to ties defining cribs therebetween, and the machine arrangement being adapted to move continuously on the track in an operating direction, which comprises the combination of

(a) means for removing the ballast,

(b) means for cleaning the removed ballast and for returning cleaned ballast under the track ties, and

(c) additional means arranged rearwardly of the ballast cleaning means in said direction for filling the cribs with clean ballast, with

(d) means arranged rearwardly of the additional means in said direction for tamping the ballast in the cribs filled with clean ballast and under the ties adjacent thereto, the tamping means having (1) thrust tamping tools immersible in the cribs,

(e) a displacement drive operable to displace the tamping means in said direction relative to the continuous movement of the ballast removing, cleaning and crib filling means, and

(f) track correction means arranged between the ballast removing means and the thrust tamping tools for moving the track into a desired position.

4,257,332

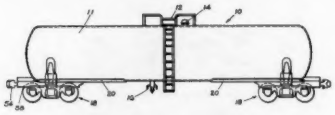
RAILWAY TANK CAR CRADLE SUPPORT

Mark A. Sechrist, Northumberland, Pa., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jun. 15, 1979, Ser. No. 48,925

Int. Cl.³ B61D *5/06;* **B61F** *1/00, 1/14*

U.S. Cl. 105—362 **5 Claims**



1. A tank car stub sill underframe comprising: a pair of angles welded to opposite sides of a longitudinally extending curved plate to form a generally channel-shaped section; including a concave top plate and a pair of vertically downwardly extending legs from said top plate; each leg including an outwardly extending horizontal flange at its base; said curved plate including an outer end portion positioned at an end of the car and extending inboard to a point adjacent a car body bolster in which the curved plate spans the distance between the vertical legs and each of the curved plate's transverse outer edges engage an upper end of one of said vertical legs; said curved plate including an intermediate portion extending from an outer side of said body bolster through said body bolster and extending to an inner side of said body bolster; in said intermediate portion transverse outer edges of the curved plate extending outwardly and above the vertical legs in a concave contour to reinforce the tank; a body bolster extending transversely on each transverse side of said intermediate portion; said body bolster including a curved top cover plate which abuts and is welded to the respective outer edges of said curved plate; an inner portion of the curved plate extending from the inner side of said intermediate portion to reinforce the tank; on each transverse side of the inner portion, the transverse extent of the curved plate being gradually reduced, forming a pair of transversely spaced, generally horizontal tapers; said curved plate being welded to the tank in said intermediate and inner portions.

4,257,333

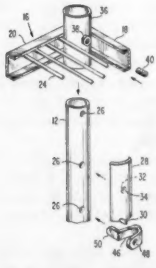
SHELVING STRUCTURE ADAPTED FOR QUICK ASSEMBLY AND ADJUSTMENT

Hyman Pollack, 41 Stonicker Dr., Lawrenceville, N.J. 08648

Filed Jan. 26, 1979, Ser. No. 6,968

Int. Cl.³ A47B *9/08*

U.S. Cl. 108—144 **9 Claims**



1. A shelf unit comprising:

(a) at least one upright;

(b) spacer means engageable with said upright, said spacer means and upright including mating means for locating the spacer means upon the upright and for engaging the spacer means against movement along the length of the upright;

(c) a sleeve receiving and freely slidable along the length of the upright, said sleeve being locatable with the spacer means interposed between the sleeve and upright, said sleeve including means for interengaging the sleeve with the spacer means when the sleeve is so located, to interlock the sleeve, upright, and spacer against relative movement; and

(d) a shelving element secured to the sleeve,

the spacer means including an abutment engageable with the sleeve to position the sleeve for interengagement with the spacer means, the spacer means being in the form of a saddle disposed in face-to-face contact with the upright upon interengagement of said mating means of the upright and spacer means,

said mating means comprising an inwardly facing lug on the saddle and a recess in the upright receiving the lug, the formation of said lug defining an outwardly facing recess on the saddle engageable by said means of the sleeve for interlocking engagement of the upright, saddle, and sleeve.

4,257,334

APPARATUS AND METHOD FOR REGULATING THE DISTRIBUTION OF GRANULATE

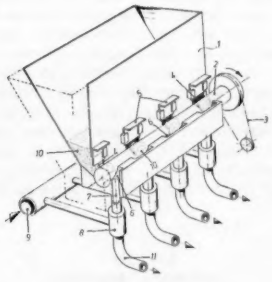
Walter Mueller, Krumbach, Fed. Rep. of Germany, assignor to Lingl Corporation, Paris, Tenn.

Filed Apr. 17, 1979, Ser. No. 30,934

Claims priority, application Fed. Rep. of Germany, May 18, 1978, 2821632

Int. Cl.³ F23K *3/02*

U.S. Cl. 110—104 R **17 Claims**



13. A method for distributing individually controllable quantities of supplied granular material to each of a plurality of consuming stations comprising the steps of:

holding a supply of the granular material within a container having plural adjustable openings spaced therealong at a lower portion of the container through which corresponding plural streams of granular material may fall;

rotating a single shaft disposed in front of the openings such that its top surface moves away from the openings during roation, the shaft being sized and positioned relative to the openings so as to effectively control as a function of the speed of shaft rotation, the respective rates at which the granular material passes thereover from the streams;

collecting into separate outlet passageways, one associated with each of the streams, granular material carried by the single rotating shaft;

injecting the granular material collected into each outlet

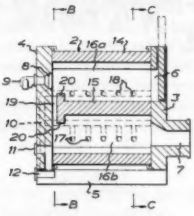
passageway into an air stream for conveyance to a single consuming station associated therewith.

4,257,335

INCINERATOR

Sören Albertsson, Älvsjö, Sweden, assignor to Bruun & Sörensen AB, Sweden

Filed Nov. 27, 1978, Ser. No. 963,787
Claims priority, application Sweden, Nov. 30, 1977, 7713569
Int. Cl.³ F23G 1/00
U.S. Cl. 110—194 **3 Claims**



1. Incinerator for crematories comprising a cylindrically shaped hollow drum mounted for rotation horizontally about its central axis, end walls sealingly engaging the ends of said drum to form an enclosed chamber, a separating wall within said chamber extending in a plane through said central axis separating said chamber into two compartments, said separating wall extending from one end wall and spaced from the other end wall to form a passageway communicating with both compartments at said spaced end of said separating wall, a charge inlet through one end wall remote from said passageway communicating with one of said compartments, a flue gas outlet through said one end wall communicating with the other of said compartments, combustible fuel supply means through the other of said end walls communicating with said one of said compartments, an ash outlet through said other end wall communicating with said other compartment, means to supply combustion air to both compartments, and means to rotate said drum intermittently through 180° so that said compartments interchange positions with respect to said charge inlet, fuel supply means, flue gas outlet and ash outlet, the incinerator being adapted so that the essential combustion of the charge takes place in said one compartment into which it is introduced through said charge inlet while the drum is stationary, and final burnout takes place after rotation of said one compartment to the position of said other compartment.

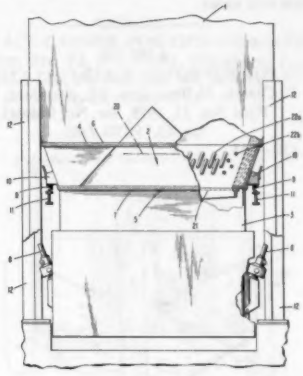
4,257,336

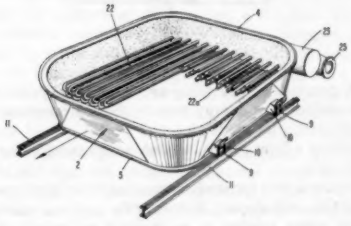
ARRANGEMENT IN INCINERATOR

Hermann Etnestad, Gjovik, and Sverre Laugerud, Harestua, both of Norway, assignors to O. Mustad & Son A/S, Gjovik, Norway

Filed Feb. 16, 1979, Ser. No. 12,749
Claims priority, application Norway, Feb. 17, 1978, 780550
Int. Cl.³ F23G 5/00, 7/00
U.S. Cl. 110—245 **7 Claims**

1. A fluidized bed incinerator apparatus, comprising:
(a) a windbox having an upper edge defining an opening;
(b) an upper shell section situated above and spaced from the windbox, the upper shell section having a lower edge defining an opening; and
(c) an annular shell section wherein the fluidized bed is located, the annular shell section having a lower edge for abutting the upper edge of the windbox and having an upper edge for abutting the lower edge of the upper shell section, the annular shell section being movable from a position of abutment between the windbox and the upper





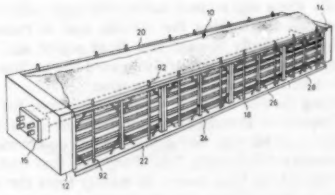
shell section openings to a position laterally spaced from said openings.

4,257,337

SILICON CARBIDE FURNACE SIDE FRAMES

Robert C. Thiel, P. O. Box 716, Niagara Falls, Ontario, Canada (L2E 6V5)

Filed Mar. 19, 1979, Ser. No. 21,662
Claims priority, application Canada, Mar. 15, 1979, 323483
Int. Cl.³ F23M 5/00
U.S. Cl. 110—336 **5 Claims**



1. A furnace side member for retaining a flowable granular substance in the furnace comprising:
(a) a base portion
(b) a plurality of upstanding supports affixed to said base portion
(c) a plurality of vertically spaced vanes supported by said upstanding supports
(d) said vanes sloping downwardly and inwardly toward said granular substance; the spacing between said vanes and the configuration of said vanes being chosen such that

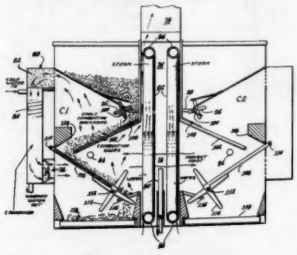
the granular substance will not flow outwardly through said side member under the effect of gravity, but gases may flow unrestrictedly upwardly and outwardly between said vanes.

4,257,338

PROCESS FOR IMPROVED SOLID FUEL COMBUSTION

Norman E. Chasek, 24 Briar Brae Rd., Stamford, Conn. 06903

Filed Sep. 21, 1978, Ser. No. 944,411
Int. Cl.³ F23B *7/00*
U.S. Cl. 110—341 **24 Claims**



1. A process for providing improved combustion and focussed radiant heat energy transfer from a combusting solid fuel comprising the steps of:

providing a front region through which radiant heat energy can pass;

providing a first inclined combustion zone having an upper portion and sloping downwardly and rearwardly from said upper portion in an inclined downward direction away from said front region;

providing a second inclined combustion zone positioned generally below said first zone and having a second upper portion, said second inclined zone sloping downwardly and forwardly away from said second upper portion in an inclined downward direction toward said front region;

supplying the solid fuel to be burned to said upper portion of said first inclined combustion zone;

allowing the solid fuel to progress downwardly and rearwardly along said first combustion zone;

allowing the solid fuel to transfer from the rear of said first combustion zone to said upper portion of said second combustion zone;

allowing the solid fuel to progress downwardly and forwardly along said second combustion zone while the fuel is burning for causing the burning fuel to radiate heat energy forwardly toward said front region and also to radiate heat energy upwardly toward the inclined lower surface of said first combustion zone;

for heating the fuel in said first combustion zone for driving off impurities therefrom as gaseous emissions and for beginning to burn the fuel along said first combustion zone for causing the burning fuel along said first combustion zone to radiate heat energy forwardly from the inclined lower surface of said first combustion zone toward said region and also downwardly toward the upper surface of said second combustion zone;

thereby providing for radiant heat energy to be radiated and transferred between said lower and upper surfaces while both of said surfaces are radiating forwardly toward said front region;

controlling the temperature of combustion by varying the physical separation between said combustion zones; and

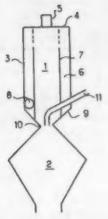
utilizing the heat energy radiated forwardly toward said front region in a generally focussed manner by said lower and upper surfaces.

4,257,339

PROCESS FOR TREATING SUBSTANCES IN DIFFERENT PHASES, SUCH AS THE TREATMENT OF SUBSTANCES IN LIQUID, SEMI-LIQUID OR PASTE FORM, BY ANOTHER NOTABLY GASEOUS PHASE

Francois Prudhon, Versailles, and Augustin Scicluna, Aubervilliers, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation-in-part of Ser. No. 916,477, Jun. 19, 1977, abandoned, which is a continuation of Ser. No. 770,802, Feb. 22, 1977, abandoned, which is a continuation of Ser. No. 479,774, Jun. 17, 1974, abandoned. This application Nov. 27, 1978, Ser. No. 963,768
Claims priority, application France, Jun. 20, 1974, 74 22620
Int. Cl.³ F23G *5/00*
U.S. Cl. 110—346 **7 Claims**



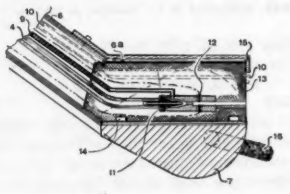
1. Process for treating substances in liquid, semi-liquid or paste or solids phase form by means of another, preferably gaseous phase, with or without entrained solid materials; process according to which in zone one called reaction zone, a reaction is ensured between fluid currents in a zone away from any wall, by introducing a gaseous phase in symmetrical helicoidal flow defining a cylindrical axial zone, introducing into said axial zone a phase consisting of substances capable of reacting with the substances constituting the helicoidal current, and that said substances are brought to a temperature at which a reaction begins; characterized by causing the helicoidal current, after meeting with the axial phase, to pass through a confined space and that at least one other phase to be treated is introduced into a treatment zone along the axis of revolution of the consequently formed swirling flow, the momentum of the volume elements of said swirling flow at the level of passage in the confined space being equal to at least 100 times that of the momentum of the axial phase.

4,257,340

TRACTOR-DRAWN SEEDING APPARATUS

Seve-Mikael Mickelsson, Bollnäs, and Sture R. Hall, Alfta, both of Sweden, assignors to AB Issesunds Bruk, Iggesund, Sweden

Filed Nov. 15, 1978, Ser. No. 960,951
Claims priority, application Sweden, Nov. 23, 1977, 7713206
Int. Cl.³ A01C *5/04*
U.S. Cl. 111—1 **5 Claims**



1. Apparatus for seeding singulated forest seeds, for connection to the rear of tractor-drawn ground preparing means, comprising a generally tubular member having one end connected by means of a universal joint to said tractor-drawn

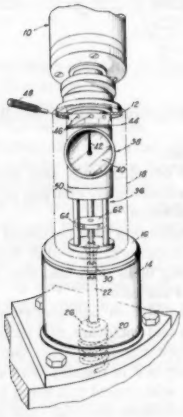
means at an elevated distance above the ground for movement in vertical and lateral direction, the other end of said tubular member having a terminal portion extending at an angle to said tubular member in a generally horizontal direction, said terminal portion extending through a generally pear-shaped tamping means carried by said terminal portion for compacting the soil while being dragged along the ground and having its pointed end facing in the direction of drag, said tubular member comprising conduit means, including pneumatic means supported by elastic stuffing material in said terminal portion for ejecting seeds at the rear of said tamping means as the latter is dragged along the ground, said universal joint comprising a first arm pivoted to said ground-preparing means to move about a vertical axis, and a second arm supporting said tubular member pivoted to said first arm to move about a horizontal axis, the length of said arms relative to the length of said tubular member being proportioned so as to allow said tubular member to move relatively freely vertically and horizontally in response to unevenness in the terrain while being relatively resistant to twisting while being dragged along the ground.

4,257,341

SPRING PRESSURE ADJUSTING TOOL FOR CAN CLOSING MACHINE

Jerry T. Roberts, 2255 Arrowwood Dr., Macon, Ga. 31206

Filed Sep. 27, 1979, Ser. No. 79,532
Int. Cl.³ B21D *51/26*
U.S. Cl. 113—7 R **11 Claims**



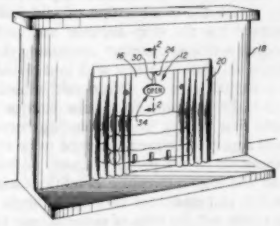
1. In a can seaming machine, a seaming station including a seaming spindle and an associated seaming chuck adapter, an axially aligned can holding chuck including a wear plate spaced from the seaming chuck adapter, a pressure spring disposed in the can holding chuck and requiring adjustment of its tension, an adjusting screw in the can holding chuck associated with said spring and having a wrench socket, a locking screw in the can holding chuck to lock the adjusting screw and having a wrench through opening aligned with said socket, a mechanical force gage adapted for placement under said seaming chuck adapter, the improvement comprising an in situ adjusting tool to adjust the pressure of said spring and adapted for placement between said wear plate and mechanical force gage, said tool comprising top and bottom plate members, circumferentially spaced legs interconnecting the plate members, and a wrench bar including a turning head arranged guidingly inside of said legs with the wrench bar depending centrally from said turning head and being received through an aperture in said bottom plate member, whereby downward movement of said wrench bar and said turning head and subsequent rotation of the turning head enables the rotation of said spring pressure adjusting screw in situ.

4,257,342

FIREPLACE DAMPER POSITION INDICATOR

Donald R. Ditto, Rte. #2, Box #60F2, Winnsboro, Tex. 75494

Filed Dec. 14, 1978, Ser. No. 969,466
Int. Cl.³ G09F *7/18*
U.S. Cl. 116—307 **6 Claims**



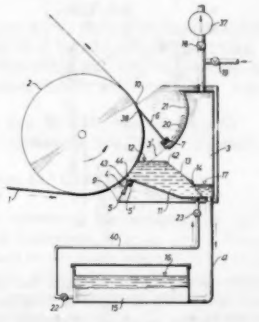
1. In a fireplace having a damper above the fireplace opening and a lintel for supporting the opening, a fireplace damper position indicator comprising: a sign with a U-shaped cross section having a first side acting as one leg of the U-shaped cross section, a second side acting as the other leg, and a connector member joining the first and second sides, said first side having indicia embossed thereon for indicating open and said second side having indicia embossed thereon for indicating closed; a wire-like hanger pivotally secured to said connector member on said sign; and magnetic connector means for pivotally securing said wire-like hanger to and downwardly of said lintel and that positions said sign in said fireplace opening.

4,257,343

COATING APPARATUS WITH VACUUM BIASED DOCTOR BLADE

Mats O. Kullander, Säffle, Sweden, assignor to Billeruds Aktiebolag, Säffle, Sweden

Division of Ser. No. 523,051, Nov. 12, 1974, abandoned. This application Jan. 29, 1979, Ser. No. 7,636
Claims priority, application Sweden, Nov. 16, 1973, 7315528; Aug. 2, 1974, 7409968
Int. Cl.³ B05C *3/12, 11/04, 11/10*
U.S. Cl. 118—50 **12 Claims**



1. Apparatus for continuously coating a strip of material, such as a web of paper, with a liquid, comprising a support member over which the strip material is passed in the coating operation, wall means forming a box having at least one open side, said box positioned adjacent said support member so that a portion of the periphery of said support member is located

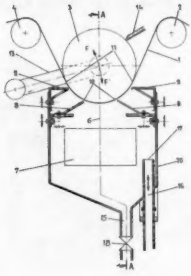
within the range of the open side in said box, means for supplying a coating liquid into said box so that the strip of material passing over said support member contacts the liquid therein, a first flexible wiping blade positioned within said box and extending into the range of the open side of said box for providing a wiping action on the strip of material following the completion of its passage in contact with the coating liquid, said first wiping blade having a supported edge spaced from said support member and a free edge spaced from and opposite said supported edge with said free edge being in line contact with the strip of material passing over said support member to effect said wiping action the combination of said wall means, said support member for the strip material and said first wiping blade providing a closed chamber containing the coating liquid, and means in communication with said closed chamber for providing a partial vacuum within said closed chamber as compared to higher pressure conditions exterior of said closed chamber, said first wiping blade extending between said free edge and said supported edge positioned to be exposed to and flexibly responsive to the partial vacuum within said closed chamber and the higher pressure conditions exterior of said closed chamber, and means for varying the angle between said first wiping blade and the strip of material, and said means for varying the angle between said first blade and the strip of material comprises a portion of the closed chamber wall having the shape of a circular arc, and a part secured to said supported edge of said first blade spaced from said support member and having the shape of a circular arc complementary to and movably mounted on said arcuate wall portion, and means disposed within the chamber defining a pivotably adjustable spillway for regulating the level of the coating liquid therein, and further means comprised of a bottom portion of the chamber wall providing a preliminary smoothing and compressing action on the strip, said further means comprising a flexible blade member disposed in a biased contact with said strip as it commences its passage through the closed chamber.

4,257,344

DEVICE FOR DEPOSITING A LIQUID BINDER ON A FIBROUS SHEET FOR MANUFACTURING CIGARETTE FILTERS

Francois Coq, 1 rue Pierre Loti, 66000 Perpignan, France

Filed Nov. 1, 1978, Ser. No. 956,566
Claims priority, application France, Dec. 23, 1977, 77 38957
Int. Cl.[3] B05C *5/00*; B05B *15/04*
U.S. Cl. 118—301 **6 Claims**



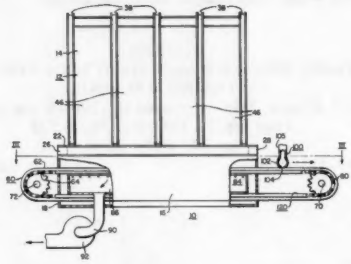
1. A device for depositing a liquid agent for binding fibres on a fibrous sheet comprising artificial or synthetic short fibres, such as cellulose acetate fibres for producing cigarette filters, said sheet having been produced by a paper-making method or a non-woven method, said device comprising a rotary unperforated support cylinder associated with two auxiliary cylinders located on each side of a vertical plane containing the axis of rotation of the support cylinder, the sheet being in the course of the travel thereof in contact with the two auxiliary cylinders by one of its faces and with the support cylinder by its other face, spraying means disposed on the side of the sheet opposed to the rotary support cylinder and below the support cylinder for spraying the binding agent upwardly on the fibrous sheet as the fibrous sheet travels round the axis of the support roller, and deflecting means disposed on opposite sides of a vertical axis in said vertical plane and extending upwardly toward and terminating in close proximity to the support cylinder so as to mask parts of the support cylinder and expose only a desired area of the sheet which is in contact with the support cylinder to the binding agent coming from the spraying means.

4,257,345

ELECTROSTATIC POWDER COATING INSTALLATION

Larry D. Brice, Athens, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 21, 1978, Ser. No. 944,446
Int. Cl.[3] B05C *15/00*
U.S. Cl. 118—634 **10 Claims**



1. An eletrostatic powder coating installation comprising:
an enclosure;
a supply container;
means operably coupled with said supply container for delivering electrostatically charged powder into the interior of said enclosure;
a filter belt movable in a predetermined direction of travel through said enclosure, said filter belt having first and second opposing faces with said first face bounding said interior of said enclosure;
a second belt movable in said predetermined direction of travel through said enclosure, said second belt having first and second opposing faces with said first face of said second belt disposed in registry with said second face of said filter belt, said second belt being formed of a harder, more abrasive resistant material than said filter belt;
a suction device having a suction side, including means for supporting both said second belt and said filter belt in a predetermined plane in the interior of said enclosure, said suction device being effective through said means for supporting said belts, said second belt and said filter belt for attracting excess powder from the interior of said enclosure to said first face of said filter belt, said second belt being disposed between said means for supporting said belts and said filter belt with said second face of said second belt confronting said means for supporting said belts, to prevent contact between said second face of said filter belt and said means for supporting said belts;
a cleaning device operably associated with said filter belt for removing excess powder which has deposited on said first face of said filter belt, said cleaning device having a suction nozzle directed towards said first face of said filter belt;
a suction blower having a suction side; and
a separator;
said suction nozzle being connected by means of said separator with said suction side of said suction blower, said

separator having an outlet disposed in flow communication with said supply container.

4,257,346

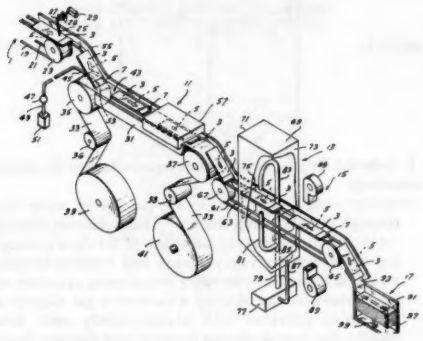
APPARATUS FOR MOUNTING TISSUE SECTIONS WITH AN U.V. LIGHT CURABLE MOUNTING MEDIUM

Leonard Ornstein, White Plains; Hazel E. Williams, Ossining, and Julius Intraub, Plainview, all of N.Y., assignors to Technicon Instruments Corp., Tarrytown, N.Y.

Division of Ser. No. 749,557, Dec. 10, 1976, Pat. No. 4,120,991. This application May 30, 1978, Ser. No. 910,411

Int. Cl.³ B05C *5/00*; G01N *1/28*

U.S. Cl. 118—641 **4 Claims**



1. A system for preparing a plurality of specimens affixed to transparent carriers comprising:

(a) a plurality of transparent carriers each having a first surface facing in the same direction;

(b) a plurality of discrete thin biological cellular specimens;

(c) said biological cellular specimens being affixed to said first surface of said transparent carriers;

(d) means adapted and constructed when said system is operated to move said transparent carriers sequentially along a pre-determined path and to expose at least that portion of said first surface having said affixed specimens;

(e) means operatively disposed for bathing the specimen with a volatile solvent containing a low concentration of a polymerizable material.

(f) a further source of liquid polymerizable material, said polymerizable material being transparent when polymerized;

(g) means further disposed along said path and adapted and constructed when said system is operated to supply material from said source subsequent to evaporation of said volatile solvent sequentially onto each of said specimens on said first surface of said plurality of transparent carriers and in sufficient quantity to encapsulate said each specimen;

(h) an optically smooth oxygen impermeable continuous elongate planar member;

(i) means further disposed along said path adapted and constructed when said system is operated to sequentially sandwich said specimen between said first surface of said transparent carrier and said planar member;

(j) means further disposed along said path adapted and constructed when said system is operated to expose said polymerizable material to ultra-violet light subsequent to being sandwiched, so as to polymerize said polymerizable material disposed between said planar member and said corresponding surfaces of said transparent carriers;

(k) means adapted and constructed when said system is operated to part said planar member from said transparent carriers;

4,257,347

PROCESS AND APPARATUS FOR ELECTROPHOTOGRAPHIC DEVELOPMENT OF LATENT IMAGES ON SHEET-LIKE CARRIERS

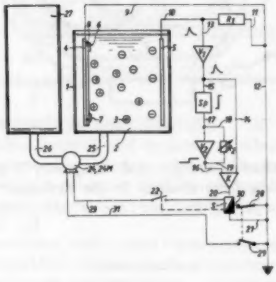
Werner Stahl, Heimstetten, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 67,823

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1978, 2836837

Int. Cl.³ G03G *15/10, 15/22*

U.S. Cl. 118—662 **5 Claims**



1. Apparatus for electrophotographic development of latent images on electroradiographic sheets, comprising a vessel for a dispersion of charged toner particles in a dielectric fluid; a pair of spaced-apart electrodes disposed in said vessel and dipping into said fluid, a sheet whose latent image is to be developed being adjacent to one of said electrodes in said fluid whereby the inserted sheet induces the flow of an electric current between said electrodes; measuring means including resistor means connected between said electrodes to establish a potential difference while said current flows between said electrodes, a source of reference voltage, and a comparator circuit having a first input connected to said resistor means, a second input connected to said source of reference voltage, and an output which transmits output signals denoting the difference between said reference voltage applied to said second input and the voltage taken off said resistor means and applied to said first input; and means for regulating the development of the latent image in said vessel as a function of said output signals.

4,257,348

DEVICE MEASURING THE CONCENTRATION OF TONER IN A DEVELOPER MIXTURE

Peter Prohaska, Nüremberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt/Main, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,351

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727402

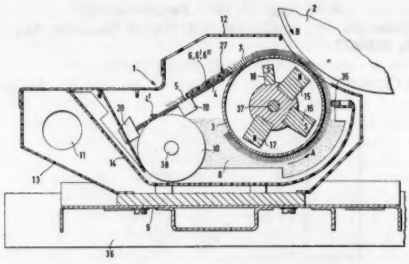
Int. Cl.³ G03G *15/08, 15/09*

U.S. Cl. 118—689 **10 Claims**

1. A device for measuring the concentration of toner in a developer mixture composed of toner and a ferromagnetic carrier material, said device being adapted for installation in an electrophotographic developing device and comprising: a measuring oscillator which comprises an inductance-including component comprising a plurality of coils electrically connected to one another, wherein said coils are located on both sides and adjacent to one another on each side of a strip of insulating material which is part of the inductance-including member, said inductanc including member being separated from said developer by an electrically insulating material;

means for passing all of the developer mixture which is not applied to a drum into the zone of inductance, said means

includes a cylinder for applying the developer mixture to a photoconductive surface of said drum mounted above the cylinder, said insulating material rests upon a deflection plate extending tangentially to said cylinder and at an angle with a horizontal; and



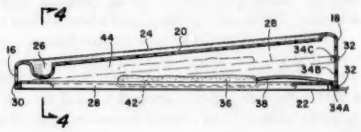
means for evaluating changes in the frequency of said oscillator resulting from changes in the developer mixture composition passing over the zone of inductance.

4,257,349

ANABOLIC RECOVERY HEATING UNIT FOR SMALL ANIMALS

Milton O. Carlin, 13111 E. 11th St., Tulsa, Okla. 74108

Filed Jan. 18, 1979, Ser. No. 4,472
Int. Cl.³ A01K *67/00*
U.S. Cl. 119—1 **1 Claim**



1. An anabolic recovery unit for small animals comprising:

rectangular frame of impervious material having a planar top surface and integral, downwardly depending, spaced apart end walls and side walls, the lower edge of the end and side walls being in a common plane forming a base on which the frame rests, the top being planar and inclined downwardly from one end to the other, the frame having an integral raised lip around the periphery thereof, and having a fluid retaining recess adjacent the lower end; the frame top being dimensioned for receiving small animals thereon;

a rectangular shelf having dimensions less than the interior spacing between said frame end walls and side walls, the shelf being supported within the frame walls below said top;

an electrical heating pad having smaller dimensions than the shelf being supported on said shelf, there being an air space between the top lower surface and the heating pad; and

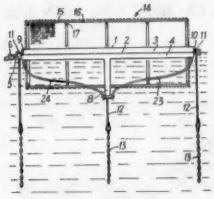
means of elevationally positioning said shelf to vary the spacing of said heating pad from said frame top comprising one end of said shelf being pivotally affixed to the interior of the shortest of said frame end walls and the other end of said shelf being supported to the interior of the opposite frame end wall at selectable elevations.

4,257,350

METHOD AND DEVICE FOR PRACTICING MARINE AQUACULTURE

Rodolphe H. Streichenberger, Nantes, France, assignor to Francis Devin, Nantes; Camille Lemarchand, Cellier and Antonius Streichenberger, Nantes, all of, France

Filed Nov. 9, 1978, Ser. No. 959,440
Claims priority, application France, Nov. 14, 1977, 77 34100; Feb. 6, 1978, 78 03178
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—3 **41 Claims**



1. A device for practicing marine aquaculture in the open sea comprising:

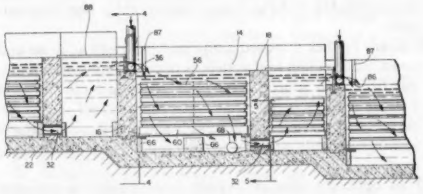
container means which allows the passage of water therethrough for containing fishes or alevins therein, buoyancy means for controlling the buoyancy of the device comprising permanent-buoyancy means and variable-buoyancy means, said variable-buoyancy means being provided with inlet means for introducing a buoyancy gas thereto and also being provided with a permanently open downwardly directed discharge opening and descent limiting weight means including a plurality of weights suspended underneath said container means for limiting the descent of said container means completely to the bottom of the sea when the buoyancy of said variable buoyancy means is reduced or cancelled out.

4,257,351

BIVALVE PRODUCTION FLUME

Edward D. Scura, Kapaa; Andrew M. Kuljis, Kahaluu, both of Hi., and Roger L. Courchesne, Burlington, Mass., assignors to Aquatic Farms, Ltd., Oahu, Hi.

Filed Apr. 18, 1979, Ser. No. 31,000
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—4 **17 Claims**



1. A bivalve productin flume comprising a first upwelling trench, a first production trench contiguous thereto with a common wall therebetween, means for introducing water to said first upwelling trench, means for causing water to overflow from said first upwelling trench into said first production trench when the water in the former reaches a predetermined level therein, means located adjacent said common wall and extending substantially thereacross for substantially continuously co-mingling nutrient-bearing water with said overflow whereby the water entering said first production trench is a mixture of the water from said first upwelling trench and said nutrient-bearing water, a plurality of perforated trays in stacked relation in said first production trench with bivalves

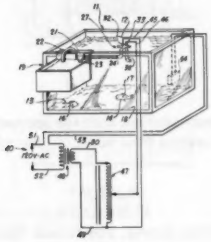
positioned thereon whereby said water mixture filters downwardly through said trays and bivalves, and means adjacent the bottom of said first production trench for permitting outflow of said water mixture therefrom.

4,257,352

PROTOZOAN MARINE LIFE INHIBITOR

William Habegger, Pittsburgh, Pa., assignor to Ronald J. Randazza, Penn Hills, Pa., a part interest

Filed Apr. 12, 1979, Ser. No. 29,302
Int. Cl.³ A01K *63/04*; C02F *1/72*
U.S. Cl. 119—5 **5 Claims**



1. A protozoan marine life inhibitor system for use in combination with a marine aquarium containing saline water, said system including

first, second and third conduit means,

pump means, and

an electrolytic protozoan marine life inhibitor means,

said first conduit means in communication with said saline water and said pump,

said second conduit means interconnected between said pump and said electrolytic protozoan marine life inhibitor for delivery of saline water from said aquarium through said first conduit means said pump means and said second conduit means to said electrolytic protozoan marine life inhibitor means, said third conduit means connected to said electrolytic protozoan marine life inhibitor means and positioned to receive and return said saline water to said marine aquarium,

said electrolytic marine life inhibitor means including an alternating current power source and a pair of spaced apart rod shaped electrodes electrically connected to said alternating current power source, said spaced apart rod shaped electrodes are positioned within a chamber positioned above the level of said aquarium water such that said saline water flows through said chamber of said electrolytic protozoan marine life inhibitor means and at right angles to said rod shaped electrodes,

said alternating current power source provides power of a level sufficient to heat said water flowing through said chamber,

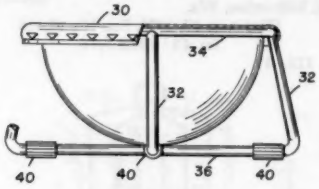
a heat limit control means responsive to the temperature of said aquarium water and controllably electically connected to said alternating current power source to interrupt said alternating current power to said electrolytic protozoan marine life inhibitor means whenever the temperature of said water exceeds a predetermined level, whereby protozoan life forms carried by said saline water have their continued growth terminated, and said saline water temperature is maintained at said predetermined level.

4,257,353

DISPOSABLE PET DISH

Kathy S. Imhoff, 1609 Anita Lane, Newport Beach, Calif. 92660

Filed Nov. 16, 1978, Ser. No. 961,476
Int. Cl.³ A01K *5/00*; B65D *25/16*
U.S. Cl. 119—61 **5 Claims**



1. A disposable pet dish comprising:

a bowl-like member, said bowl-like member being of very thin disposable material, said bowl-like member being a turned lip at the upper edge thereof, said bowl-like member and said turned lip being monolithically molded of one piece; and

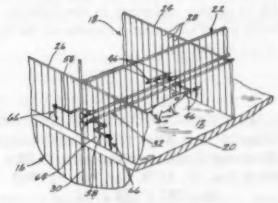
a support frame, said support frame being configured so that said bowl-like member may be placed therein, said support frame having a top member of a configuration to surround and fit said bowl-like member, said top member being of a cross-sectional configuration to fit into said turned lip at the upper edge of said bowl-like member, said turned lip snapping into place over said top member, said support frame having a plurality of leg member affixed to said top member to support said top member with the bowl-like member thereon, said support frame having a system of cross-brace members affixed to said plurality of leg members.

4,257,354

MEANS FOR ADJUSTING HEIGHTS OF NIPPLE WATERERS

John E. Gillette, Kalona, and Mark S. Mittelberg, Iowa City, both of Iowa, assignors to Confinement Specialists, Inc., Kalona, Iowa

Filed Jun. 21, 1979, Ser. No. 50,766
Int. Cl.³ A01K *7/06*
U.S. Cl. 119—72.5 **10 Claims**



1. Means for adjusting the heights of animal waterers in a multi-cage livestock confinement system, comprising,

a plurality of longitudinally positioned livestock cages,

an elongated partiton closing one side of each of said cages,

at least one dividing partition extending away from said elongated partition to divide one cage from another,

an elongated waterpipe having a longitudinal axis rotatably mounted on said elongated partition and being in communication with each of said cages,

a watering valve in each of said cages attached to said waterpipe,

means for connecting said waterpipe to a source of water under pressure,

and means for rotating said waterpipe about its longitudinal axis to move said watering valves to different elevations.

4,257,355

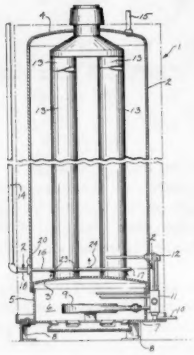
COLD WATER INLET TUBE

Robert E. Cook, Kankakee, Ill., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Aug. 17, 1979, Ser. No. 67,416

Int. Cl.³ F22B *5/00*

U.S. Cl. 122—17 **4 Claims**



1. For use with a water heater having a cylindrical tank provided by a cylindrical shell closed by upper and lower heads and a cold water conduit and a hot water conduit and means to heat the water stored therein, the improvement comprising a cold water inlet tube adapted to extend through an opening in the tank shell to the inside of the tank and be lodged in a horizontal plane adjacent the lower head, means at the outer end of the tube adapted to connect the latter to the cold water conduit, the inner end of the cold water inlet tube being closed and the tube being of a size to readily slip through the opening in the shell for insertion and removal for cleaning, a single generally centrally located jet-like opening in the upper surface of the tube formed somewhat in the shape of a nozzle for discharge of incoming cold water upwardly toward the upper head of the tank to overcome the problem of stacking, and a plurality of corresponding intermittent openings adjacent the bottom of the tube for discharge of cold water toward the lower head to agitate sediment in the bottom of the tank and prevent build up of sediment deposits on the inner surface of the lower head of the tank.

4,257,356

HEAT EXCHANGING APPARATUS AND METHOD

Lawrence E. Minnick, Los Altos Hills, Calif., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Jun. 22, 1978, Ser. No. 917,803

Int. Cl.² F22B *1/04*

U.S. Cl. 122—32 **9 Claims**

1. A heat exchanger apparatus, comprising:

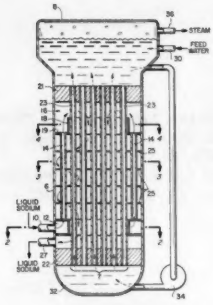
(a) a plurality of heat transfer tubes adapted for conveying a first fluid;

(b) a shell surrounding the heat transfer tubes and adapted for circulating a second fluid about the tubes so that the first and second fluids can be brought into thermal communication;

(c) an inlet nozzle to the heat exchanging apparatus for the second fluid;

(d) a distribution manifold for the second fluid connected to the inlet nozzle and located within the shell; and

(e) a plurality of heat transfer conduits connected to the distribution manifold and located within the shell for conveying the second fluid, said heat transfer conduits being adapted for bringing the second fluid therein into



thermal communication with the second fluid in the shell prior to the second fluid being circulated within the shell.

4,257,357

FURNACES

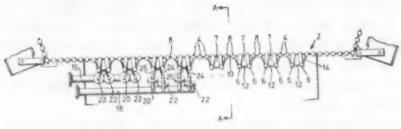
Ronald A. Ashdown, Surrey, and Gerald Mannasseh, London, both of England, assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jan. 17, 1979, Ser. No. 4,137

Claims priority, application United Kingdom, Jan. 16, 1978, 1696/78

Int. Cl.³ F22B *15/00*

U.S. Cl. 122—235 B **5 Claims**



1. A furnace having a substantially vertical wall comprising a plurality of generally vertically extending tubes for placing fluid in indirect heat exchange with the heat generated within the furnace and fins extending between said tubes, said tubes including a plurality of first straight tubes and a plurality of second tubes having a portion outwardly offset from the wall, said wall having a plurality of upright concave recesses open to the interior of the furnace, each of said recesses being defined by the outwardly offset portions of a plurality of said second tubes, second fins extending between each of said outwardly offset portions and between said outwardly offset portions and said first straight tubes, a fuel nozzle disposed in one of said second fins of each recess to feed fuel into said recess, an opening defined in another one of said second fins of each recess for the entry of combustion air into said furnace, the second fin in which the fuel nozzle is disposed and the second

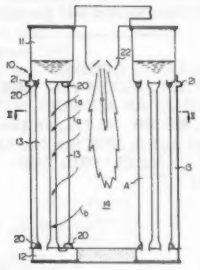
fin having the opening for combustion air being disposed at an angle to one another, so that fuel supplied from said fuel nozzle and combustion air supplied from said opening will enter into the recess in converging streams.

4,257,358

BOILER

Masashi Watanabe, Kamakura, Japan, assignor to Ebara Corporation, Tokyo, Japan

Filed Jun. 25, 1979, Ser. No. 51,740
Int. Cl.[3] F22B *21/00*
U.S. Cl. 122—235 R **12 Claims**



1. A boiler comprising:

a tubular casing;

a pair of annular chambers disposed at opposite ends of said tubular casing and joined thereto, respectively;

a first closed annular wall means within said casing extending coaxially with said casing and spaced from said casing to leave an outer flue therebetween and having an outer wall portion and an inner wall portion defining a space therebetween which is coupled with both said chambers at the opposite ends of said wall means so as to place said chambers in communication through said space;

second closed annular wall means within said casing and within said first wall means and spaced from said first wall means to define an inner flue between said first wall means and said second wall means, said second wall means having an outer wall portion and an inner wall portion defining a space therebetween which is coupled with both said chambers at the opposite ends of said wall means so as to place said chambers in communication through said space;

said second wall means and said pair of annular chambers defining within the centers thereof a combustion chamber, the center hole of one of the annular chambers being closed;

a burner extending through the center hole of the other annular chamber and directed toward said combustion chamber;

an exhaust opening located in the casing and communicating with said outer flue;

first gas duct means extending through said first wall means from said inner flue to said outer flue, said first duct means having intake opening means opening into said inner flue adjacent one of said annular chambers and a first discharge opening means opening into said outer flue adjacent the other of said annular chambers;

second gas duct means extending through said second wall means from said combustion chamber to said first flue, said second duct means having intake opening means opening into said combustion chamber adjacent said other of said annular chambers and a discharge opening means opening into said inner flue adjacent said one of said annular chambers; and

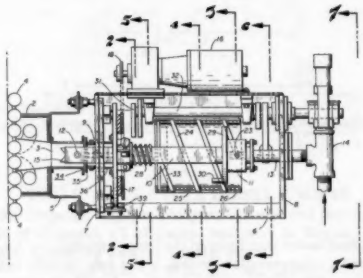
additional gas passage means extending through said second wall means adjacent said other annular chamber.

4,257,359

MECHANISM FOR ROTATING AND RECIPROCATING A SOOT BLOWER

Salvatore A. Capobianco, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 29, 1979, Ser. No. 43,582
Int. Cl.[3] F23J *3/02*
U.S. Cl. 122—390 **7 Claims**



1. A structure for inserting a fluid lance within a furnace and delivering fluid onto the internal wall of the furnace to remove foreign matter from the wall, including,

a furnace wall with an opening which provides access to the internal side of the wall from external the wall of the furnace,

an elongated frame mounted by one end over the wall opening and extending normal the plane of the wall,

a lance in the form of an elongated conduit mounted within the frame and provided a range of axial movement wherein it reciprocates from which range the lance extends one of its ends into the furance interior through the opening,

a nozzle mounted on the first end of the lance which is inserted into the furnace interior from which cleaning fluid is injected into the interior of the furnace and onto the interior wall to remove foreign matter accumulated thereon,

a feed tube extended into the second end of the lance within the frame to conduct cleaning fluid into the lance so it will exit through the nozzle on the first end of the lance,

a valve in the feed tube to control the flow of cleaning fluid in the feed tube,

a motive means mounted in stationary relationship to the frame,

a linkage means between the motive means and the lance to rotate the lance by the motive means,

a section of the frame containing spiral grooves about the lance,

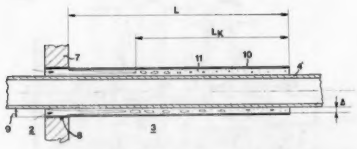
an extension structure mounted on the lance and extended into engagement with the spiral grooves which arrangement causes reciprocation of the connected lance over its range when the lance is rotated by the motive means,

and actuating linkage connected to the fluid valve and extended to the forward end of the range of lance reciprocation in the arrangement whereby the lance contacts the linkage and actuates the valve to flow steam through the feed tube and into the lance when the nozzle of the lance is positioned within the furnace interior.

4,257,360
FEED WATER PREHEATER

Peter von Böckh, Hohentengen-Herdern, Fed. Rep. of Germany, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jul. 19, 1979, Ser. No. 59,103
Claims priority, application Switzerland, Aug. 18, 1978, 8780/78
Int. Cl.³ F22D 1/00
U.S. Cl. 122—412 14 Claims

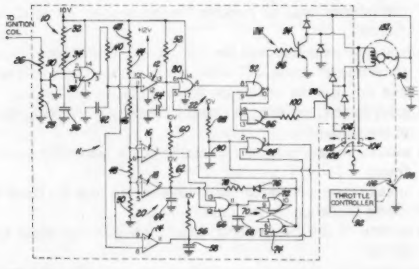


1. In a feed water preheater of the type comprising a condensation space, a supercooler section, and a tube bundle extending within said supercooler section and said condensation space for conducting feed water which is to be preheated by steam conducted through said supercooler section, said tube bundle passing through a support plate which partitions said supercooler section from said condensation space, clearance being provided between individual tubes of said tube bundle and openings in said support plate through which said tubes pass, the improvement wherein said tubes are surrounded by sleeves extending from said support plate, there being provided an annular gap between said sleeves and said tubes, said annular gap being filled with steam condensate along at least a portion of the length thereof during operation of the preheater, to prevent the entry of steam into said condensation space.

4,257,361
CONTROL CIRCUIT FOR ENGINE SPEED GOVERNOR

Stanley J. Kasiewicz, 29852 Springhill Dr., Southfield, Mich. 48076

Filed Jun. 11, 1979, Ser. No. 47,544
Int. Cl.³ F02D 11/10
U.S. Cl. 123—352 10 Claims

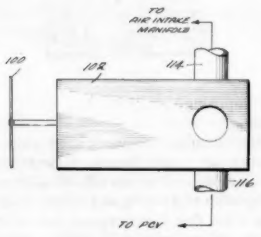


1. In a speed governing system for an engine having a throttle control means, a reversible motor adapted to be connected with said throttle control means, speed sensing means adapted to be connected with said engine for developing a speed voltage corresponding to engine speed, first and second switching means for energizing said motor respectively in the forward and reverse directions, first logic means operatively coupled with said sensing means and said switching means for energizing said motor in a close throttle direction when the engine speed exceeds a predetermined governed value, second logic means for energizing said motor in an open throttle direction when the throttle control means reaches a reference position whereby said motor is driven alternately in the close throttle and open throttle directions to cause the engine speed to be maintained in the vicinity of said governed value, and third logic means responsive to a predetermined value of acceleration of said engine for energizing said motor in the close throttle direction before said speed reaches said predetermined governed value and means including said second logic means for energizing said motor in the open throttle direction when the energization of said motor, in response to the third logic means, causes the throttle control means to reach said reference position, whereby the throttle control means enables continued acceleration toward said governed value.

4,257,362
METHOD AND APPARATUS FOR VARYING THE FUEL RATIO OF AN AIR-FUEL MIXTURE

Samuel Leonardi, 809 NW. 7th Ter., Ft. Lauderdale, Fla. 33311

Filed Aug. 8, 1978, Ser. No. 931,948
Int. Cl.³ F02D 7/00
U.S. Cl. 123—392 5 Claims



3. An apparatus for varying the fuel ratio of a fuel-air mixture supplied to a carburetor of an internal combustion engine of a vehicle having a radiator at the front end thereof, a pollution control valve and a carburetor, said apparatus comprising:

a block of metal disposed behind said radiator having a first inlet in communication with the atmosphere, a first internal passage between a second inlet for connection to said pollution control valve and an outlet for connection to said carburetor, and a second passage opening into said first passage at a port and connected to said first inlet;

valve means disposed in said second passage and having a seat for closing said port; and

wind gate means disposed in front of said radiator directly exposed to said atmosphere, mounted on said block, for pivotal motion in response to air pressure produced by vehicle movement, said gate means being connected to said valve means for opening said port as said gate means pivots.

4,257,363
METHOD AND APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE DURING AND AFTER ENGINE BRAKING

Hans Zeller, Grafenau, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 22, 1978, Ser. No. 935,831
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1977, 2738886
Int. Cl.³ F02P 5/02; F02B 5/02
U.S. Cl. 123—423 15 Claims

1. A method for controlling the operation of an internal combustion engine during and after engine braking comprising the steps of:

retarding the ignition timing of said engine for a limited time during and after engine braking;

terminating fuel supply to said engine at the end of an interval after the retardation of timing,

completing the process of said timing retardation before fuel shut-off;

during a subsequent momentary period of acceleration maintaining retardation of said ignition timing; and

thereafter returning the ignition timing of said engine to normal setting in a preselectable manner in order to insure smooth and gentle transition from normal operation of said vehicle to engine braking.

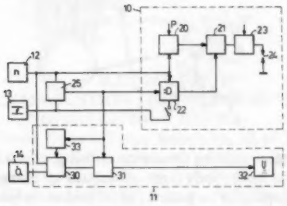
7. An apparatus for controlling an internal combustion engine during and after engine braking comprising

throttle valve position indicator means (**13**) coupled to a throttle plate (**54**),

fuel control means (**11**),

ignition timing means (**10**),

transducers for generating signals related to engine speed and to engine load,



engine braking detector circuit means (**25**) for receiving said transducer generated signals related to engine speed and engine load and for generating a signal indicative of engine braking which can be selectively applied to said ignition timing means and to said fuel control means for respectively changing the ignition timing and the fuel flow to the engine during and after generation of said engine braking signal, said timing means including a timing shifter circuit which is an electro-pneumatic device for changing the adjustment of the engine timing and which includes a chamber which is connected to an induction tube of the engine at least at one of the positions upstream of said throttle plate and downstream of said throttle plate, said chamber being connected via a throttle (**65**) and a solenoid valve (**66**) to the induction tube manifold (**55**), the coil of said solenoid valve (**66**) being energized via an engine speed-dependent switch (**71**) and a further switch (**70**) whose switching state depends on the angle of opening of the said throttle plate, the coil of said solenoid valve and said switches (**70** and **71**) being connected in electrical series.

4,257,364

METHOD AND SYSTEM FOR CONTROLLING IGNITION TIMING

Daisaku Sawada; Takashi Shigematu, and Yuji Takeda, all of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 16, 1979, Ser. No. 39,679

Claims priority, application Japan, May 19, 1978, 53-60276

Int. Cl.[3] **F02P** *5/04*

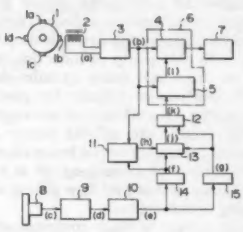
U.S. Cl. 123—425 **14 Claims**

1. A method for controlling ignition timing, comprising the steps of:

generating a knocking signal pulse related to the occurrence of knocking in an engine;

discriminating when the time interval between knocking signal pulses is shorter than a time period;

generating a pulse train having an interval shorter than that of the knocking signal pulse train when the interval of the knocking signal pulse is discriminated to be shorter than said time period; and



delaying said ignition pulses by a period related to said generated pulse train and said knocking signal pulse train.

4,257,365

TWO-STROKE CYCLE DIESEL ENGINE

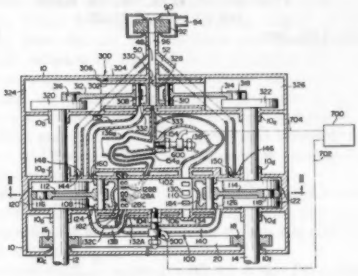
Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, and Isao Igarashi, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 6, 1979, Ser. No. 18,025

Claims priority, application Japan, Oct. 6, 1978, 53-123728

Int. Cl.[3] **F02B** *25/08;* **F02D** *39/04;* **F02B** *33/22*

U.S. Cl. 123—51 B **22 Claims**



1. A two stroke cycle diesel engine, comprising:

(a) a two-stroke cycle power cylinder-piston assembly, including:

(1) a power cylinder having scavenging ports proximate one axial end thereof and exhaust ports proximate the other axial end thereof, said scavenging ports being arranged substantially symmetrically around the central axis of said power cylinder for generating a substantially uniform, cylindrical, uniflow, spiral scavenging flow through said power cylinder;

(2) first and second horizontally opposed power pistons disposed within said power cylinder;

(3) first and second crankcases;

(4) first and second crankarms, a respective one of said crankarms being operatively connected to a respective one of said power pistons and disposed in a respective one of said crankcases; and

(5) an exhaust pipe in fluid communication with said exhaust ports;

(b) a scavenging pump device including a reciprocating type pump cylinder-piston assembly separate from and driven by said power cylinder-piston assembly, said pump cylinder-piston assembly including a pump cylinder in fluid communication with said power cylinder and a pump piston disposed within said pump cylinder for reciprocat-

ing motion, said scavenging pump device supplying scavenging air for said spiral scavenging flow in said power cylinder; and

(c) a scavenging air introducing device for introducing scavenging air to said power cylinder, including

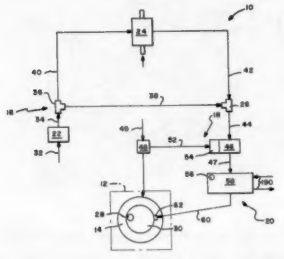
(1) a forced swirl generating device in direct fluid communication with said pump cylinder for receiving compressed air from said pump cylinder-piston assembly and with said power cylinder for generating in said power cylinder a forced swirl of scavenging air rotating about the central axis of said power cylinder, said forced swirl generating device being adapted to provide said forced swirl of scavenging air at a greater force than said spiral scavenging flow during a later stage of scavenging operation; and

(2) a fuming device in fluid communication with said scavenging air and with a source of fuel for producing fume from part of said scavenging air and part of said fuel to be supplied to said power cylinder, said fuming device being incorporated in said forced swirl generating device and being disposed within said exhaust pipe, the exhaust gases flowing in said exhaust pipe heating said fuming device and said fume produced thereby by heat exchange.

4,257,366
FUEL FEED SYSTEM AND METHOD FOR GASOLINE BURNING INTERNAL COMBUSTION ENGINE

Robert C. Strem; Richie C. Strem, both of Newcastle, and John H. Eberle, Colfax, all of Calif., assignors to Omnewtronics, Inc., Carson City, Nev.

Filed Jan. 25, 1979, Ser. No. 6,355
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—554 **9 Claims**

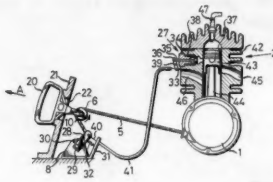


1. A system for feeding gasoline fuel into a gasoline burning combustion engine, said system comprising: means for supplying gasoline fuel in a liquid state from a supply tank to a vaporization chamber; means for providing a stream of preheated air and directing said preheated air into said vaporization chamber; means including said vaporization chamber for vaporizing said liquid gasoline in said chamber whereby the vaporized gasoline and said preheated air combine within said chamber; and means for directing said combination of vaporized gasoline and preheated air to said engine, whereby said preheated air prevents said vaporized gasoline from condensing to a liquid state before reaching said engine, said vaporizing means including a housing defining said vaporization chamber therein and including means for receiving said stream of preheated air and liquid gasoline and directing said stream into said chamber, a plurality of vaporization plates, each including a member located within said chamber and having a front and back side and means for directing a portion of said stream entering said chamber onto the front side of one of said members and a portion of said entering stream onto the front side of a second one of said members, whereby at least some of the liquid gasoline impinging on the front side of each of said members is vaporized and carried through the member by said preheated air.

4,257,367
ENGINE STARTING DEVICE

Tetsuzo Fujikawa, Kobe, and Tomoya Kimura, Kakogawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Continuation of Ser. No. 853,071, Nov. 21, 1977, abandoned.
This application May 15, 1979, Ser. No. 39,418
Claims priority, application Japan, Nov. 22, 1976, 51-140345; Nov. 22, 1976, 51-156649; Nov. 22, 1976, 51-156650; Nov. 22, 1976, 51-156651; Nov. 22, 1976, 51-156652
Int. Cl.³ F02N *3/02*; F01L *13/08*
U.S. Cl. 123—185 BB **1 Claim**



1. An engine starting device comprising: recoil starter means including a main body and an actuating elongated flexible element adapted to be pulled out of said main body to actuate an engine for starting the same; actuating means for pulling the elongated flexible member of said recoil starter means; a movable wheel means rotatably supported by said actuating means and having an intermediate portion of said elongated flexible element trained thereover; said movable wheel means being moved when said actuating means is operated whereby the elongated flexible element can be pulled out of said main body of the recoil starter means in a length which is greater than the distance covered by the movement of said movable wheel means; and auxiliary engine starting means connected to the forward end of said elongated flexible element after the latter is trained over said movable wheel means and turned back toward the main body of said recoil starter means with the movable wheel means serving as a turning point, whereby said auxiliary engine starting means can be actuated simultaneously as said recoil starter means is actuated.

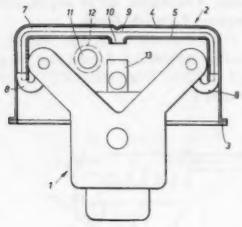
4,257,368
SOUND INSULATED INTERNAL COMBUSTION ENGINE

Peter Hofbauer, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Dec. 5, 1978, Ser. No. 966,567
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1977, 2756378
Int. Cl.³ F02B *77/02*
U.S. Cl. 123—195 C **8 Claims**

1. In an internal combustion engine including an engine block defining a plurality of combustion chambers, a plurality of air intake nipples affixed to the engine block and being associated with the combustion chambers for supplying air thereto; a sound insulating capsule covering the engine and surrounding a space about the engine; means defining an inlet opening in the capsule for admitting intake air from the outside of said capsule into said space; an intake manifold formed of a plurality of individual air intake conduits each having a downstream end connected to a respective said intake nipple; and an air filter located upstream of the intake manifold for filtering the intake air prior to the passing of the intake air into the intake manifold; the improvement wherein said capsule has

wall portions integrally constituting said air intake conduits in their entirety; further wherein said wall portions form stiffening parts of said capsule; and further wherein said air intake



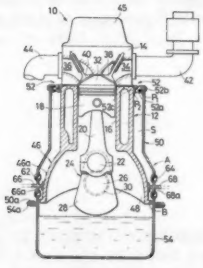
conduits have a free upstream end inside the capsule downstream of and spaced from said inlet opening for receiving intake air from said inlet opening.

4,257,369

INTERNAL COMBUSTION ENGINE EQUIPPED WITH NOISE CONTROL DEVICE

Eiichi Abe; Naoki Ogawa; Takao Kubozuka, all of Yokohama, and Hirofumi Takei, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 31, 1978, Ser. No. 938,659
Claims priority, application Japan, Sep. 6, 1977, 52-106301
Int. Cl.[3] F02B *77/00*
U.S. Cl. 123—198 E **10 Claims**



1. An internal combustion engine of a motor vehicle including an engine block provided with a crankcase, and a cylinder head secured to the cylinder block, said engine comprising:

a sound-insulating cover secured to a portion of the engine block which portion is spaced apart from the crankcase, maintaining a hermetical seal between said sound-insulating cover and the engine block, said sound-insulating cover being located in spaced relation to and around the outer surface of the engine block to cover the engine block, said sound-insulating cover being provided with a first flange portion;

an oil pan adapted to be filled with an engine oil, which is hermetically connected to said sound-insulating cover to be spaced apart from the crankcase of the cylinder block, said oil pan being provided with a second flange portion, the second flange portion bending over the first flange portion to provide a secure connection of said oil pan with said sound-insulating cover; and

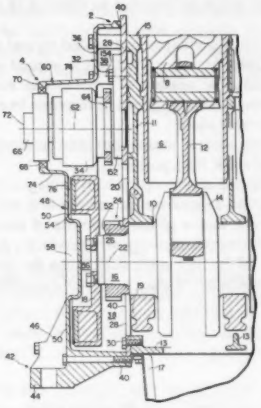
a seal member disposed in a space defined by an edge of the first flange portion and a surface of the second flange portion which bends over the first flange portion.

4,257,370

COMBINED GEAR COVER AND MOUNT FOR AN INTERNAL COMBUSTION ENGINE

Edward W. Kasting, Seymour, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 29, 1978, Ser. No. 974,562
Int. Cl.[3] F16M *1/02*
U.S. Cl. 123—198 E **17 Claims**



1. A gear cover for the accessory gear train of an internal combustion engine, which internal combustion engine includes an engine block having an end wall, an engine crankshaft extending from the end wall, a drive gear mounted on the crankshaft outward of the end wall, a crankshaft vibration damper secured to the crankshaft outward of the drive gear, and at least one accessory gear mounted in the radial plane defined by the driving gear, said gear cover comprising:

(a) a front panel arranged to be positioned outwardly of the drive and accessory gears in a generally parallel, spaced relationship to the end wall;

(b) a side wall integrally connected to the peripheral portion of said front panel and extending therefrom in a generally perpendicular direction to terminate in a rim adjacent the end wall; and

(c) damper housing means connected to said front panel for receiving and completely enclosing the crankshaft vibration damper when said gear cover is mounted on the internal combustion engine, said damper housing means including a forward wall parallel to and spaced outwardly from said front panel by a predetermined distance, said damper housing means also including a natural frequency increasing means for increasing the natural frequency of the internal combustion engine to reduce the amount of noise emitted by the internal combustion engine during engine operation, said natural frequency increasing means having an annular surface recessed relative to said forward wall of said damper housing means and arranged concentrically with respect to the rotational axis of the engine crankshaft when said gear cover is mounted on the internal combustion engine.

4,257,371

SPLIT OPERATION TYPE MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Yasuhiko Ishida, Mishima, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 31, 1979, Ser. No. 8,037
Claims priority, application Japan, Feb. 10, 1978, 53-13626
Int. Cl.[3] F02M *13/04*; F02D *17/00*
U.S. Cl. 123—198 F **8 Claims**

1. An internal combustion engine having a plurality of cylin-

ders which are divided into a first cylinder group and a second cylinder group, said first cylinder group having a first intake passage and a first fuel supply means, said second cylinder group having a second intake passage and a second fuel supply means, said engine comprising:

a first valve shaft arranged in said first intake passage;

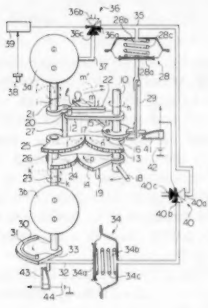
a first throttle valve fixed to the first valve shaft for controlling the amount of combustible mixture fed into said first cylinder group in response to rotation of said first valve shaft;

a second valve shaft arranged in said second intake passage;

a second throttle valve fixed to the second valve shaft for controlling the amount of combustible mixture fed into said second cylinder group in response to rotation of said second valve shaft;

acceleration control means movable between an idle position and a full load position;

a first actuating means operatively engageable between the acceleration control means and the first and second valve shafts such that a given increment of movement of the acceleration control means will produce a greater angle of rotation of the first valve shaft when the level of the load of said engine is low than when the level of the load of said engine is high, and such that movement of the acceleration control means will produce rotation of said second valve shaft only when the level of the load of said engine is higher than a predetermined level;



a second actuating means operatively engageable between the acceleration control means and the first and second valve shafts such that movement of the acceleration control means will produce rotation of both said first valve shaft and said second valve shaft in accordance with the level of the load of said engine;

means for operatively engaging said first actuating means only when the engine temperature is higher than a predetermined value and for operatively engaging said second actuating means only when the engine temperature is equal to or lower than said predetermined value;

a control means for fully opening said second throttle valve and for stopping the supply of fuel to said second cylinder group when the level of the load of said engine is lower than said predetermined level; and

means for energizing said control means only when said first actuating means is operatively engaged between said acceleration control means and said first and second valve shafts.

4,257,372

INTERNAL COMBUSTION ENGINE EXHAUST PASSAGE STRUCTURE

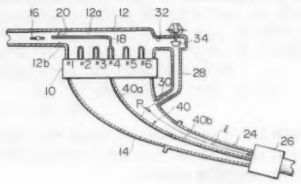
Yukihiro Etoh, Yokohama; Toshiaki Tanaka, Fujisawa, and Kazuya Kunii, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Oct. 26, 1979, Ser. No. 88,820

Claims priority, application Japan, Dec. 8, 1978, 53-169191

Int. Cl.³ F02D *17/00;* **F02B** *47/08;* **F01N** *3/15*

U.S. Cl. 123—198 F **1 Claim**



1. An internal combustion engine comprising:

(a) a plurality of cylinders split into first and second groups;

(b) means responsive to engine low load conditions for cutting off flow of fuel and fresh air to said second group of cylinders;

(c) an exhaust passage provided with a catalyzer;

(d) a partition extending through said exhaust passage to the vicinity of said catalyzer to divide said exhaust passage into two passages, one connecting with said first group of cylinders, the other connecting with said second group of cylinders;

(e) an EGR passage bypassing said second group of cylinders for exhaust gas recirculation; and

(f) an EGR valve provided in said EGR passage and adapted to open said EGR passage in response to engine low load conditions.

4,257,373

INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

John A. McDougal, 2801 S. Port Hwy., A-4, Flint, Mich. 48507, and John W. Lennington, Ypsilanti, Mich., assignors to John A. McDougal, Detroit, Mich.

Division of Ser. No. 800,959, May 26, 1977, Pat. No. 4,116,173, which is a continuation of Ser. No. 572,167, Apr. 28, 1975, abandoned, which is a division of Ser. No. 336,559, Feb. 28, 1973, Pat. No. 3,903,856. This application Aug. 16, 1978, Ser. No. 934,322

Int. Cl.³ F02P *5/04*

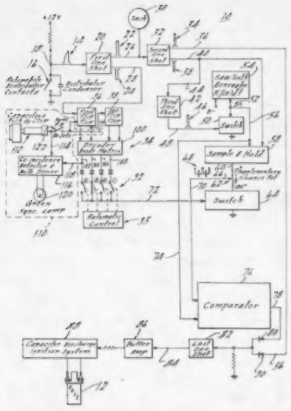
U.S. Cl. 123—424 **35 Claims**

1. For an engine having a wall means defining a combustion chamber and ignition means associated with said combustion chamber for igniting a charge in said combustion chamber at times established at least in accordance with an operating cycle of said engine, the ignition of said charge producing a flame front in such combustion chamber, a system for controlling the timing of the ignition of the charge for said combustion chamber comprising:

detecting means for responding to the arrival of said flame front at a predetermined location in said combustion chamber and for providing a detecting means signal dependent thereon;

timing means for determining the time at which said charge is ignited in said combustion chamber, said timing means

being responsive to said detecting means signal for varying said time relative to said operating cycle of said engine



on a subsequent operating cycle of said combustion chamber in accordance with said detecting means signal.

4,257,374

METHOD OF CONTROLLING INTERNAL COMBUSTION

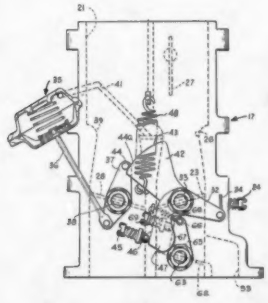
Hiromitsu Matsumoto, Hamamatsu, and Minoru Yamada, Iwata, both of Japan, assignors to Yamaha Hatsukoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 1, 1978, Ser. No. 965,484

Claims priority, application Japan, Mar. 10, 1978, 53-27967

Int. Cl.³ F02B *17/00, 3/00*

U.S. Cl. 123—432 **14 Claims**



1. An induction system for an internal combustion engine having at least one variable volume chamber in which combustion occurs comprising a main induction passage for delivering a charge to said chamber, said main induction passage having a flow control portion, an auxiliary induction passage for delivering a charge to said chamber, said auxiliary induction passage having a substantially lesser cross-sectional area than said main induction passage whereby a given mass flow rate through said auxiliary induction passage will enter said chamber at a substantially greater velocity than the same mass flow rate through said main induction passage, said auxiliary induction passage having its outlet disposed in close proximity to said chamber so that the charge delivered to said chamber through said auxiliary induction passage enters said chamber at substantially undiminished velocity, and throttle valve means for controlling the proportion of flow to said chamber through said induction passages, said throttle valve means comprising a primary throttle valve in said main induction passage flow control portion for controlling the flow therethrough and a secondary throttle valve for effecting control of the flow through said auxiliary induction passage, the improvement comprising linkage means for controlling the movement of one of said throttle valves upon movement of the other of said throttle valves, said linkage means being effective to provide for opening of the other throttle valve to the point at which the flow through the auxiliary induction passage is no longer increased in proportion to the amount of movement of the other valve and then initiating opening of the one throttle valve.

4,257,375

FUEL INJECTION SYSTEM FOR MIXTURE-COMPRESSING INTERNAL COMBUSTION ENGINES WITH SPARK IGNITION

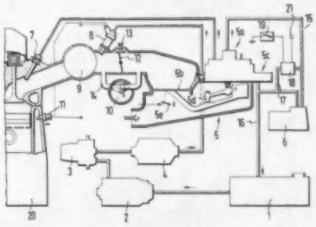
Johann-Georg Ulrich, Mühlacker, Fed. Rep. of Germany, assignor to Dr. Ing. H.c.F. Porsch Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 22, 1978, Ser. No. 972,210

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757248

Int. Cl.³ F02M *59/32, 59/42*

U.S. Cl. 123—453 **1 Claim**

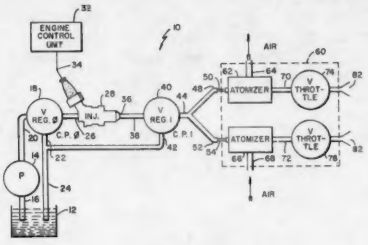


1. In a fuel injection system for mixture- compressing, spark-ignition internal combustion engines with continuous injection into the intake manifold, of the type having a starter, a measuring element and a deliberately operable power control element connected in series, said measuring element being moved as a function of the air volume through-put, so as to displace a fuel valve disposed in a fuel supply line for metering a volume of fuel which is proportional to the air volume, and a warmup control for enriching the fuel-air mixture during the warmup of an internal combustion engine, the warm-up control being connected by a control pressure line with the fuel valve and by a zero-pressure fuel return line with a fuel tank, the improvement comprising a bypass line interconnecting the control pressure line and the fuel return line in bypassing relationship with respect to said warm-up control, and a solenoid valve disposed in said bypass line, and means for controlling said valve as a function of the temperature of the internal combustion engine and the starter voltage, wherein the valve in the bypass line, the control means therefor, and the starter are constructed and interconnected for opening said bypass line only when the temperature of the engine is above a predetermined value during operation of said starter, said bypass line being closed in response to closing of the solenoid valve when said starter voltage is zero.

4,257,376
SINGLE INJECTOR, SINGLE POINT FUEL INJECTION SYSTEM

Gene Y. Wen, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 17, 1978, Ser. No. 934,434
Int. Cl.³ F02M *39/00*
U.S. Cl. 123—472 **35 Claims**

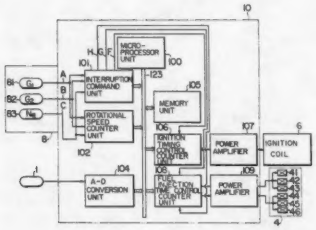


1. An engine fuel injection system wherein a fuel injector emits a controlled sequence of discrete fuel charges which are atomized and supplied through an intake manifold to a plurality of engine cylinders, comprising: flow control means, disposed intermediate the fuel injector and the intake manifold in a flow passage therebetween, for extending the time duration of each fuel charge emitted by the injector to convert the sequence of fuel charges to a continuous flow of fuel.

4,257,377
ENGINE CONTROL SYSTEM

Masumi Kinugawa, and Hisamitsu Yamazoe, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 4, 1979, Ser. No. 81,905
Claims priority, application Japan, Oct. 5, 1978, 53-123186; Jul. 3, 1979, 54-84807
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—492 **3 Claims**



1. A control system for internal combustion engines comprising:

means for generating an intake signal related to an intake parameter of an internal combustion engine;

means for generating a speed signal related to a rotational speed of said engine;

means for generating timing signals related to rotational positions of said engine;

means responsive to said timing signals for processing said intake signal and said speed signal to generate a fuel output signal indicative of the amount of fuel to be injected in said engine and an ignition output signal indicative of the timing of ignition spark supplied to said engine, said output signals generating means being programmed to (a) divide an intake difference between the currently generated intake signal and the precedingly generated intake signal by the precedingly generated intake signal to produce a first intake change rate, (b) produce a first intake parameter value from the currently generated intake signal, the precedingly generated intake signal and a predetermined first coefficient dependent on said calculated first intake change rate, (c) determine the timing of ignition spark from said speed signal and said calculated first intake parameter value, (d) divide a speed difference between the currently generated speed signal and the precedingly generated speed signal by the precedingly generated speed signal to produce a speed change rate, (e) produce a speed value from the currently generated speed signal, the precedingly generated speed signal and a predetermined second coefficient dependent on said calculated speed change rate, (f) divide an intake difference between the currently generated intake signal and the precedingly generated intake signal by the precedingly generated intake signal to produce a second intake change rate, (g) produce a second intake parameter value from the currently generated intake signal, the precedingly generated intake signal and a predetermined third coefficient dependent on said second intake change rate, and (h) determine the amount of fuel to be injected from said calculated speed value and said calculated second intake parameter value;

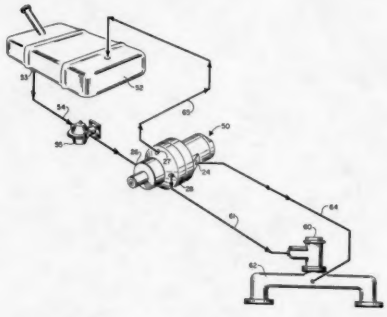
means responsive to said fuel output signal for controlling the amount of fuel injected in said engine; and

means responsive to said ignition output signal for controlling the timing of ignition spark supplied to said engine.

4,257,378
UPGRADER VARIABLE PRESSURE REGULATOR

Joseph A. Bascle, Jr., Baton Rouge, La.

Continuation of Ser. No. 928,579, Jul. 27, 1978, abandoned, which is a continuation of Ser. No. 775,011, Mar. 7, 1977, abandoned. This application May 15, 1979, Ser. No. 39,423
Int. Cl.³ F02M *59/20*
U.S. Cl. 123—512 **7 Claims**



1. An air-fuel metering regulator for adjusting the flow of fuel to, for example, an internal combustion engine operating under idling, cruising and accelerating power conditions, comprising:

a. a housing;

b. a fuel diaphragm within said housing, said fuel diaphragm and said housing providing a fuel chamber within said housing, and said fuel chamber is provided with a fuel supply inlet and a fuel supply outlet;

c. a vacuum diaphragm within said housing, said vacuum diaphragm and said housing providing a vacuum chamber within said housing, said vacuum chamber provided with an opening to which a supply of engine vacuum pressure is connectable; and

d. valve means associated with said fuel chamber for controlling the rate of flow of fuel into said fuel supply inlet into said fuel chamber to said fuel supply outlet, said valve

means being actuated by reciprocations of said fuel diaphragm, and said fuel diaphragm is reciprocated by motion of said vacuum diaphragm, said motion of said vacuum diaphragm produced by the supply of engine vacuum pressure connected to said fuel vacuum chamber, said valve means comprising in part maximum flow adjustment means in cooperation with said valve means and externally mounted on said housing for adjusting the maximum flow rate of fuel through said valve means, said valve means further comprising in part minimum flow adjustment means in cooperation with said valve means and externally mounted on said housing for adjusting the minimum flow rate of fuel through said valve means, said valve means being a needle valve having an inner valving needle, said valving needle being urged into contact at its end portion with said fuel diaphragm, and reciprocations of said fuel diaphragm within said fuel chamber producing a corresponding reciprocation in said valving needle and a variation of fuel flow from said inlet through said needle valve into said fuel chamber.

4,257,379

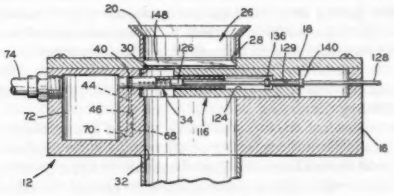
CARBURETOR

Nelson F. Hickling, Toledo, Ohio, assignor to John-Nelson Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 908,973, May 24, 1978. This application Jun. 28, 1979, Ser. No. 52,938

Int. Cl.³ F02M *25/08, 37/20*

U.S. Cl. 123—518 **14 Claims**



1. Fuel control means for supplying an air-fuel mixture to an internal combustion engine, said control means comprising a body, said body forming an upright main passage extending therethrough and having an upper air intake portion, a lower air-fuel mixing portion, and an intermediate fuel-supply portion, a slide valve mounted for movement across said intermediate portion of said passage and movable between a position substantially closing said intermediate portion and a position substantially fully opening said intermediate portion, said slide valve having a bore centrally located therein parallel to the direction of movement of said slide valve, an injection tube carried by said body and extending across said intermediate portion of said passage in axial alignment with said slide valve bore, said injection tube having orifices extending along a substantial portion of the length thereof and transversely to the longitudinal extent of said passage, a vapor receptacle formed in said carburetor body, fuel supply means connecting a lower portion of said vapor receptacle with the interior of said injection tube, means for supplying fuel under pressure to said vapor receptacle, a vapor return line for connecting an upper portion of said receptacle to a fuel supply tank, a closure member carried by said slide valve in said bore, said injection tube having an inner diameter fitting closely with outer diameter of said closure member, said closure member being effective to close said orifices as said valve moves toward the closed position and being effective to open said orifices as said valve moves toward the open position, means for connecting said closure member to an accelerator pedal for causing movement of said closure member, and lost-motion means connecting said connecting means to said slide valve, whereby said closure member can move toward the open position before said slide valve moves toward the open position and said closure member can move toward the closed position before said slide valve moves toward the closed position.

4,257,380

ONE-WAY THROTTLING VALVE FOR PNEUMATIC MEMBRANE ACTUATOR IN ENGINE AIR INTAKE SYSTEM

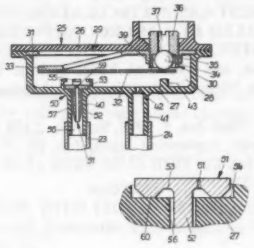
Lothar Bendig, Ludwigsburg, and Richard Hoferer, Bissingen, both of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed May 9, 1979, Ser. No. 37,997

Claims priority, application Fed. Rep. of Germany, May 18, 1978, 2821649

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—552 **6 Claims**



1. In a device for controlling the combustion air temperature of an internal combustion engine which is equipped with a carburetor in its air intake system and an air filter upstream of the carburetor, which device has intake ducts for cold raw air and preheated raw air leading to a duct junction upstream of the air filter and, associated with the duct junction, a continuously adjustable air flow proportioning valve which controls the relative flows of cold and preheated raw air that are admitted into the duct junction, said valve being driven by a spring-loaded pneumatic actuator which receives negative pressure through a vacuum line connecting it to a point downstream of the carburetor main throttle, in such a device, a valve arrangement in the vacuum line for controlling the transmission of negative pressure to the pneumatic actuator, the valve arrangement comprising in combination:

a pressure relief valve having a relief passage for the admission of a pressure reducing air flow into the vacuum line, a valve member adapted to open and close the relief passage, and a valve control member responding to the temperature of the combustion air flow downstream of the duct junction by maintaining the valve member in its closed position at a low air flow temperature and by allowing it to progressively open the relief passage, as the air temperature rises above a predetermined value, thereby reducing the negative pressure which is transmitted to the actuator and allowing the spring of the latter to readjust the position of the air proportioning valve for the admission of less preheated air; and

a one-way throttling valve in that portion of the vacuum line which extends between the pressure relief valve and the pneumatic actuator, the throttling valve including a throttling member and a small throttling orifice, the throttling member being movable between an open position in which it creates a comparatively large flow cross section in the vacuum line, for the unimpeded transmission of negative pressure to the actuator, and a closed position in which it restricts the flow cross section to the small throttling orifice, for the delayed removal of negative pressure from the actuator; and wherein

the throttling member has the form of a plunger with an elongated shaft portion and an enlarged head portion on one extremity thereof;

the plunger shaft portion is engaged in an inlet bore portion of the vacuum line, pointing in the flow direction towards the pneumatic actuator;

the plunger head portion cooperates with an annular valve seat which surrounds said inlet bore portion; and

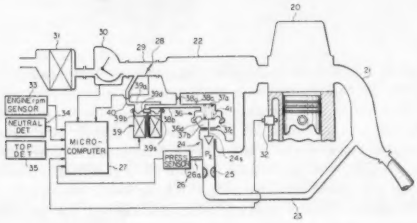
the plunger shaft portion and the inlet bore portion cooperate to guide the plunger for axial valve opening and closing movements while defining a comparatively large flow cross section therebetween, at least in the open valve position.

4,257,381

EXHAUST GAS RECIRCULATION SYSTEM CONTROLLED BY A MICROCOMPUTER FOR AN INTERNAL COMBUSTION ENGINE

Haruo Yuzawa, and Tsuneomi Yano, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 9, 1979, Ser. No. 2,132
Claims priority, application Japan, Jan. 10, 1978, 53-854
Int. Cl.[3] F02B *47/08;* F02M *25/00*
U.S. Cl. 123—571 **11 Claims**



1. An exhaust gas recirculation system controlled by a microcomputer, for an internal combustion engine in a vehicle having at least two gears one of which is a top gear, said system comprising:

(a) an exhaust gas recirculation passage interposed between an exhaust pipe and an intake manifold of said internal combustion engine, said exhaust gas recirculation passage having an orifice;

(b) an exhaust gas recirculation control valve disposed in said exhaust gas recirculation passage downstream of said orifice;

(c) first means for controlling said exhaust gas recirculation control valve in accordance with an electrical signal;

(d) second means for producing a signal indicative of the pressure of the exhaust gases in said exhaust gas passage between said exhaust gas recirculation control valve and said orifice;

(e) third means for sensing the operational condition of said engine;

(f) fourth means for sensing whether said vehicle is in said top gear or not; and

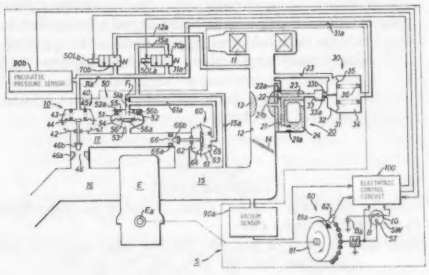
(g) fifth means responsive to said fourth means for producing said electrical signal with which said first means is controlled, said fifth means producing said signal in accordance with the pressure sensed by said second means and a value derived from one of two look-up tables, one table corresponding to the optimum pressure value of said vehicle in top gear and the other table corresponding to an optimum pressure value for the vehicle not in top gear, said pressure value within a look-up table being determined by said third means.

4,257,382

ELECTRONIC CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Takeshi Matsui, Aichi; Tokio Kohama, Nishio; Hisasi Kawai, Toyohashi; Akira Nishimatsu; Toshikazu Ina, both of Aichi; Hidetaka Nohira, and Kiyoshi Kobashi, both of Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio, and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Filed Oct. 16, 1979, Ser. No. 85,319
Claims priority, application Japan, Oct. 17, 1978, 53/127672
Int. Cl.[3] F02B *47/08*
U.S. Cl. 123—571 **10 Claims**



1. An electronic control system for an internal combustion engine having an exhaust gas recirculation system including a recirculation conduit to provide a communication between an intake manifold and an exhaust pipe of the engine, the control system comprising:

a servomotor to be operated by pneumatic pressure applied thereto;

flow control means associated with said servomotor for controlling the quantity of exhaust gases flowing through said recirculation conduit from said exhaust pipe to said intake manifold in accordance with changes of the pneumatic pressure applied to said servomotor;

first detecting means for producing a first electric binary signal indicative of rotational speed of the engine;

second detecting means for producing a second electric binary signal indicative of intake manifold vacuum of the engine;

third detecting means for detecting pneumatic pressure applied to said servomotor to produce a first electric analog signal indicative of the pneumatic pressure;

a digital computer for calculating a value indicative of optimum pneumatic pressure to be applied to said servomotor in accordance with said first and second binary signals, said computer being programmed to calculate the optimum value from a function describing a desired relationship among optimum pneumatic pressure, rotational speed and intake manifold vacuum of said engine;

means for producing second and third electric analog signals having different levels respectively proportional to the calculated optimum value from said computer, the difference between the respective levels of said second and third analog signals being defined in accordance with changes of the calculated optimum value;

a drive circuit for comparing a level of said first analog signal with each level of said second and third analog signals to produce a first output signal therefrom when the level of said second analog signal is higher than the level of said first analog signal and to produce a second output signal therefrom when the level of said third analog signal is lower than the level of said first analog signal, said drive circuit ceasing the output signals when the level of said first analog signal is in a range between the levels of said second and third analog signals; and

first and second electrically operated valves to selectively

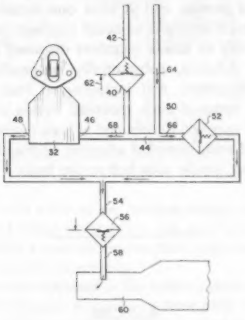
apply intake manifold vacuum and the atmospheric pressure to said servomotor when energized in response to one of said first and second output signals from said drive circuit.

4,257,383

CRANKCASE VACUUM SYSTEM

William C. Boswell, 3942 S. Detroit, Tulsa, Okla. 74105

Filed Aug. 9, 1979, Ser. No. 65,132
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—572 **7 Claims**



1. A crankcase vacuum system for an engine having a fuel pump and an intake manifold and a crankcase, said vacuum system comprising check valve means disposed in communication with the intake manifold and having a normally closed position, means providing communication between the check valve and the fuel pump and crankcase, and means providing communication between the fuel pump and the crankcase, said check valve means being responsive to pressure differentials acting thereon for opening when pressure within the intake manifold is less than pressure within the crankcase for reducing the pressure within the crankcase and for closing when the pressure within the intake manifold is greater than the pressure within the crankcase for precluding passage of said increased pressure into the crankcase, and said fuel pump being in constant communication with the crankcase for cooperating with the closed position of the check valve means to maintain the reduced pressure condition within the crank case during operation of the engine.

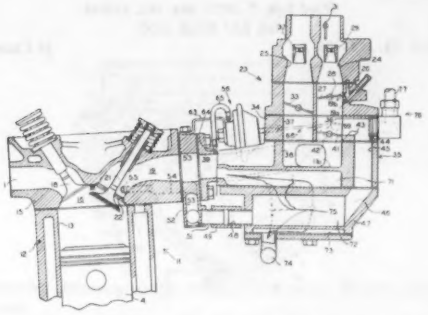
4,257,384

INTAKE CONTROL APPARATUS OF ENGINE

Hiromitsu Matsumoto, Hamamatsu, Japan, assignor to Yamaha Hatsukoki Kabushiki Kaisha, Iwata, Japan

Filed Oct. 13, 1978, Ser. No. 951,119
Claims priority, application Japan, Oct. 27, 1977, 52/129297
Int. Cl.³ F02B *75/18*
U.S. Cl. 123—575 **6 Claims**

1. An induction system for an internal combustion engine having a main intake passage for delivering a chrge to the engine, a charge forming device for delivering a fuel-air charge to said main intake passage, and a first throttle valve rotatably supported in said main intake passage downstream of the fuel discharge of said charge forming device for controlling the flow therethrough, a second throttle valve positioned in said main intake passage downstream of said first throttle valve, said second throttle valve being positioned in close proximity to said first throttle valve, an auxiliary induction passage having its inlet in communication with said main intake passage between said throttle valves, said auxiliary induction passage having its outlet in close proximity to the chamber of said engine for delivering charge directly to said chamber without substantially mixing externally of said chamber with the charge delivered thereto through said main intake passage, the improvement comprising said throttle valves being rotatable in opposite senses from their closed to their respective open



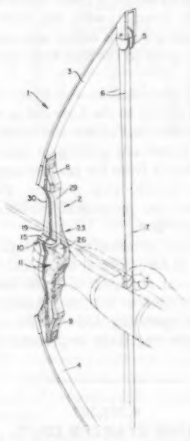
position for increasing turbulence of the fuel-air charge flowing therepast for delivery to said engine chamber through said main intake passage.

4,257,385

ARCHERY BOW WITH THUMB RECEIVING OPENING

William R. Stewart, Gainesville, Fla., assignor to Victor United, Inc., Chicago, Ill.

Filed Dec. 12, 1979, Ser. No. 102,877
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—24 R **11 Claims**

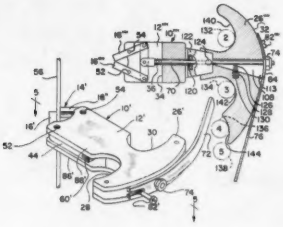


1. In an archery bow having a pair of limbs the improvement comprising, a handle including upper and lower portions connected respectively to said limbs, said handle having an arrow shelf joined to a vertical segment to define a sight window through said handle, said vertical handle segment provided with an open face disposed laterally of the plane formed by the bow handle, bow limb longitudinal center line and a bow string with said sight window correspondingly extending substantially laterally of said plane, said handle upper and lower portions having an outside surface on its side opposite that of said sight window, and a supplemental handle section on said handle having an enlargement projecting substantially perpendicular to and laterally of the plane of said handle outside surface and including a thumb opening between said enlargement and the balance of said handle and usable when the handle section is gripped by a user.

4,257,386
BOW STRING DRAWING AND RELEASING DEVICE

Matthew R. Gazzara, 345 White Horse Pike, Hammonton, N.J. 08037

Filed Feb. 7, 1979, Ser. No. 10,035
Int. Cl.[3] F41B 5/00
U.S. Cl. 124—35 A 24 Claims



1. In a bow string drawing and releasing device, the combination of

a body,

said body comprising a forward, jaw holding portion and a rearward, handle grip portion;

bow string drawing means pivotally secured to the body, to draw a bow string,

said bow string drawing means comprising a pair of openable jaws,

said jaws being adapted to be pivoted within the body between a bow string drawing position wherein the jaws touch and a bow string releasing position wherein the jaws part to define a space therebetween;

closing means in contact with the bow string drawing means, said closing means being adapted to continuously tend to bias the jaws to the said bow string drawing position;

triggering means provided in the body to urge the bow string drawing means to the bow string releasing position by overcoming the bias of the said closing means,

said triggering means comprising an operating rod extending longitudinally from the jaw holding portion entirely through the handle grip portion, the operating rod being adapted for reciprocal movement through the handle grip portion,

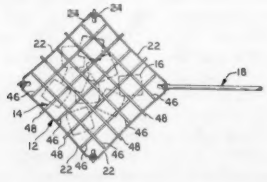
the operating rod terminating rearwardly of the handle grip portion in an enlarged head; and

an operating lever engaged with the enlarged head and pivotally connected to the handle grip portion, whereby the operating rod will be urged rearwardly when the operating lever is pivoted about the handle grip portion.

4,257,387
FIRE STARTER UNIT

Duane L. Storandt, P.O. Box 6813, St. Louis, Mo. 63144

Filed Jul. 9, 1979, Ser. No. 56,081
Int. Cl.[3] A47J 37/00; F24B 3/00
U.S. Cl. 126—25 B 11 Claims



1. A fire starter unit, comprising:

(a) a hollow body formed from a plurality of opposed pairs of adjacent interconnected panels, each panel including:
1. oppositely disposed upper and lower margin portions,
2. oppositely disposed side margin portions, and
3. at least one aperture disposed intermediate said side margin portions,

(b) fastener means connecting the side margin portions of adjacent panels,

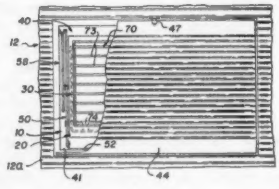
(c) a grate received within the hollow body and including:
1. a plurality of upper members disposed in side-by-side spaced relation including at least one member having opposed ends received within the panel apertures of opposed panels, and at least one member having opposed ends disposed adjacent opposed panels, and
2. a plurality of lower members disposed in side-by-side spaced relation, substantially perpendicular to said upper members, and including at least one member having opposed ends received within the panel apertures of opposed panels, and at least one member having opposed ends disposed adjacent opposed panels, and

(d) a carrying handle attached to the body.

4,257,388
FOLDABLE BARBECUE

Danny C. McGuire, 7750 Muirfield Dr., Vancouver, British Columbia, Canada V5S 2L7

Filed May 16, 1979, Ser. No. 39,469
Int. Cl.[3] A47J 37/00; F24C 5/20
U.S. Cl. 126—26 5 Claims

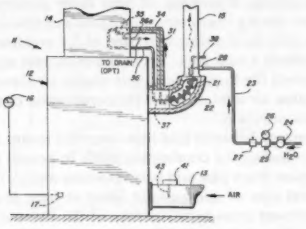


1. A foldable barbecue comprising a housing mountable within a wall recess, a cooking assembly including a carrier frame and a pan for holding fuel, said carrier frame having side and end members defining a bottom opening, said fuel-containing pan being removably supported by the carrier frame to project through the bottom opening, a pair of support arms each having inner and outer ends and a longitudinal slot, hinge means securing the inner ends of the pair of support arms to the housing, a pair of hinged braces pivotally connecting the outer ends of the pair of support arms to the housing, slide bolts secured to the side members of the carrier frame and slidably projecting through the longitudinal slots of the pair of support arms, first and second posts mounted to the carrier frame for movement between a first position in which the posts are disposed within the carrier frame and a second position in which portions of the posts protrude above the carrier frame, a rack for supporting items to be cooked, and means defined by the posts and the rack for demountably connecting the rack to the posts when the posts are in the second position and positioning the rack above the carrier frame and the fuel pan, said rack and fuel-containing pan being of a size and shape to be accommodated stacked within the carrier frame when the cooking assembly is partially dismantled and reassembled for storage within the wall recess.

4,257,389
HUMIDIFIER

Julio Texidor, 130 Kenilworth, Elk Grove Village, Ill. 60007; Arthur M. Krause, 2318 W. Justen Rd., McHenry, Ill. 60050, and Patricio Texidor, 214 E. Highland, Mt. Prospect, Ill. 60056

Filed Feb. 1, 1979, Ser. No. 8,682
Int. Cl.[3] F24F *3/14*; F02M *15/00*
U.S. Cl. 126—113 9 Claims



1. For use with a forced air furnace having an exhaust flow path for heated waste combustion gas, and having an air flow system including a cool air return duct and a warm air duct, a humidifying system comprising:

a coiled conduit disposed in the exhaust flow path for directing water through the exhaust flow path wherein at least a portion of the liquid water is vaporized into steam by the transfer of heat from the heated waste combustion gas to the liquid water, said coiled conduit being formed of tubing having rib means thereon for inducing turbulence in the waste gas and a spirally recessed internal surface for inducing turbulence in the water to thereby enhance the efficiency of heat transfer to the liquid water and to dislodge sediment from within said tubing;

means for introducing liquid water into said coiled conduit;

flow control means including a pressure regulating means and valve means for controlling the volume flow rate of liquid water introduced into said coiled conduit such that at least a portion of said water passing through said conduit remains unvaporized during each operating cycle;

means for discharging a mixture of steam and unvaporized water from said coiled conduit into the warm air duct;

drip collector means in the warm air duct for separating and collecting unvaporized water entering the warm air duct from said coiled conduit; and

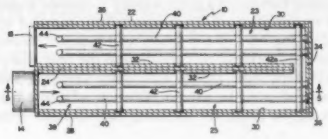
means for removing the collected unvaporized water and said dislodged sediment from the warm air duct.

4,257,390
ANDIRON AND HEAT DISTRIBUTION UNIT

Albert M. Synan, 5111 Woodland Dr., Fredericksburg, Va. 22401

Filed Jan. 9, 1979, Ser. No. 2,203
Int. Cl.[3] F24B *7/00*; F16L *11/00*
U.S. Cl. 126—121 6 Claims

1. An andiron for supporting fuel logs and for increasing heat transfer to a room, comprising a hollow, U-shaped housing with adjacent ends thereof forming, respectively, an air inlet and an air outlet; blower means at the inlet for establishing a stream of forced air through said housing; and heat exchange means in said housing for transferring heat energy to the air stream, said heat exchange means comprising an array of solid rod members including a plurality of first, horizontal, solid rod members extending transversely between and in heat exchange contact with opposite sidewalls of said housing, said first rod members being spaced apart vertically from each other and lying in a plane normal to the air stream and a plurality of second, horizontal, longitudinally extending solid rod members lying in a plane parallel to the air stream and in heat exchange contact with a rear wall of said housing, said first and second rod members being interleaved and in direct heat exchange contact with each other for increased heat absorption and heat

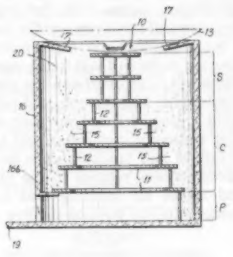


transfer efficiency to the stream of forced air flowing thereover.

4,257,391
STEPPED CONCENTRIC FIRE GRATE

Jesus R. Carin, Bulacan, Bulacan, Philippines

Filed May 18, 1979, Ser. No. 40,219
Int. Cl.[3] F23H *1/02*
U.S. Cl. 126—163 R 1 Claim



1. A fire grate comprising:

a plurality of annular horizontally arranged grate members, the width of the annulus of each grate member being substantially the same as the width of the annulus of each other of the grate members;

spacers supporting the respective grate members in a coaxial stack in vertically spaced relationship;

respective grate members at the lower end of the stack of progressively decreasing diameter in a direction upwardly of the stack to define a truncated conical structure providing a draft head of progressively decreasing diameter in an upward direction;

grate members at the upper end of the stack of substantially the same diameter as each other to define a cylindrical structure summounting said truncated conical structure, said cylindrical structure providing an upward extension of the draft head of substantially constant diameter;

the respective grate members each being of an external diameter substantially greater than the internal diameter of the next adjacent grate member in said stack.

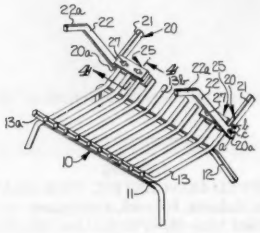
4,257,392
LOG SUPPORTING APPARATUS FOR USE WITH FIREPLACE GRATES

Walter R. Betenbaugh, 4024 Pomfret La., Charlotte, N.C. 28211

Filed Apr. 16, 1979, Ser. No. 30,145
Int. Cl.[3] F23H *13/00*
U.S. Cl. 126—164 2 Claims

1. A log supporting apparatus adapted for use with a fire-

place grate of a type having a plurality of laterally spaced bars having rear portions thereon and defining a generally horizontally extending platform for supporting combustible logs thereon, said log supporting apparatus comprising a relatively short leg portion and a relatively long leg portion extending from and at a substantially right angle to said short leg portion and defining therewith a substantially L-shaped frame member, bracket means adapted to be removably secured to rear end portions of the bars of the grate, said bracket means having a slot therein adapted to receive therein the rear end portions of the grate bars, bolt means extending through said bracket means and adapted to extend between adjacent bar rear end portions of the grate for securing said bracket means to the



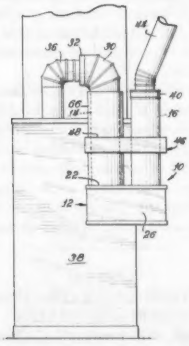
grate, and means for removably securing said L-shaped frame member to said bracket means with the short leg portion thereof extending upwardly and rearwardly at an acute angle with respect to the generally horizontally extending platform and with said long leg portion of said frame member extending upwardly and forwardly and overlying the platform for supporting other combustible logs thereon, said means for removably securing said L-shaped frame member to said bracket means comprising means for connecting said L-shaped frame member to one side of said bracket means for rearward and forward adjustment thereon relative to the platform and including threaded means for securing said L-shaped frame member in a desired adjusted position relative to said bracket means.

4,257,393

VENTING SYSTEM FOR A FUEL-BURNING HEATING PLANT

Barry D. Liberacki, Downers Grove, Ill., assignor to Energy Marketing, Inc., Downers Grove, Ill.

Filed Jul. 27, 1979, Ser. No. 61,280
Int. Cl.[3] F23J *11/02*
U.S. Cl. 126—307 A **15 Claims**



1. In a venting system for a heating plant, the heating plant having a periodically activated combustion chamber, a combustion air inlet and a flue outlet having a minimum cross-sectional area sufficient for removal of combustion gases from the combustion chamber during the combustion cycle, and the venting system having an open-bottomed diverter, a vertically disposed inlet duct attached to the diverter and connected to the flue outlet, and an upwardly extending outlet duct attached to and extending from the diverter, the outlet duct being connected to a chimney flue for expulsion of combustion gases from the heating plant, the improvement comprising:

a. heat-retention means located within the inlet duct for permitting absorption of heat from passing combustion gases during the combustion cycle and maintaining heat in the inlet duct during cessation of the combustion cycle to establish a heat lock within the inlet duct and diverter to prevent the flow of relatively cooler air through the combustion air inlet and into the combustion chamber during such cessation,

b. a passage between said heat-retention means and said inlet duct during the combustion cycle to permit flow of combustion gases past said heat retention means, the cross-sectional area of said passage being at least as great as said minimum cross-sectional area of the flue outlet, and

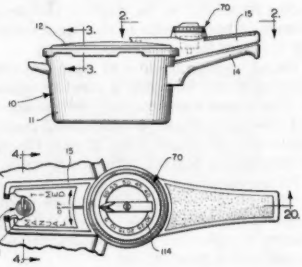
c. means spacing said inlet duct from said outlet duct to substantially eliminate direct heat transfer from said inlet duct to said outlet duct.

4,257,394

PRESSURE COOKER

Herbert E. Zabel, Wheaton, Ill., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 6, 1979, Ser. No. 64,102
Int. Cl.[3] A47J *27/00;* **H05B** *1/00;* **B67D** *5/08*
U.S. Cl. 126—374 **7 Claims**

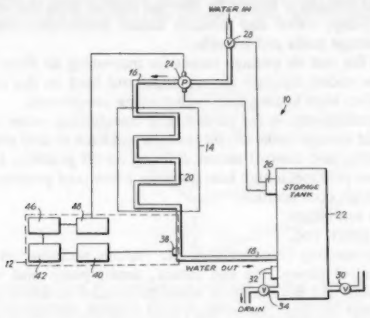


1. A pressure cooker comprising a pot and lid having locking means for interconnection of said pot and lid to provide a chamber, a pressure relief valve in said lid having a first valve spring operative to dispose said relief valve in an open position whereby the chamber is vented to the atmosphere and a second valve spring operative in opposition to said first valve spring to dispose the relief valve in a closed position whereby said chamber is not vented to the atmosphere, stress imposing means operably disposed to stress the second valve spring sufficiently to overcome the first valve spring and dispose the relief valve in a closed position, said stress imposing means comprising a timer device having a spring activated mechanism within a housing mounted on the cooker lid providing a drive shaft rotatable in one direction to load said spring for automatic reverse rotation of said drive shaft at a predetermined speed, an indicator secured to said drive shaft for manual rotation thereof in said one direction, said indicator having a cam surface thereon operative upon manual rotation of said indicator in said one direction to axially displace an associated cam follower, said cam follower being connected to the second valve spring whereby said axial displacement stresses said second valve spring, and means for maintaining the cam follower in axial displacement during automatic reverse rotation of the drive shaft.

4,257,395
FLUID FLOW CONTROLLER

Solomon Wieder, 17 Blueberry Hill Rd., Monsey, N.Y. 10952

Filed Mar. 26, 1979, Ser. No. 23,649
Int. Cl.[3] F24J *3/02*; G05D *23/00*; F04B *49/10*
U.S. Cl. 126—422 13 Claims



1. A controller for a solar heating system of the type including a collector arranged in heat exchange relation with a fluid circulating circuit, and a pump having a variable pump rate for varying the flow rate of said fluid through said fluid circuit in response to variations in the temperature of said fluid, said controller comprising:

means for sensing a temperature indicative of the temperature of said fluid in said fluid circuit and for generating a first signal indicative thereof;

means for generating a second signal indicative of a predetermined temperature;

means for comparing said first and second signals and for generating a third signal indicative of the difference therebetween;

means responsive to said third signal for generating an analog control signal, said analog control signal increasing when said third signal indicates that one of said first and second signals exceeds the other of said first and second signals, decreasing when said third signal indicates that said other signal exceeds said one signal, and remaining constant when said third signal indicates that said first and second signals are equal;

means responsive to said analog control signal for varying said pump rate as a function of said control signal for equalizing said first and second signals, said pump rate increasing when said analog control signal is in one of said increasing or decreasing modes, decreasing when said analog control signal is in the other of said increasing or decreasing modes, and remaining unchanged when said analog control signal is constant; and

biasing means for establishing a minimum pump rate when said pump is activated.

4,257,396
SOLAR COLLECTOR

Charles P. Reinert, Garvin, Minn., assignor to Solarein, Inc., Buffalo, Minn.

Filed Feb. 1, 1978, Ser. No. 874,199
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—426 12 Claims

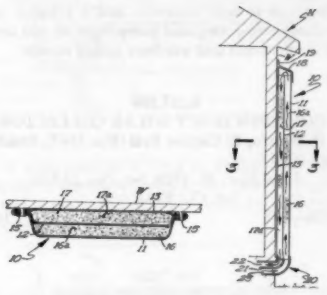
1. A solar collector adapted to be releasably attached to a building structure comprising:

an elongate, flexible tubular member comprised of front, intermediate and rear panels each being formed of a flexible fluid impervious material, said front and intermediate panels being light transmissive to permit solar energy to be transmitted therethrough, said intermediate panel cooperating with said front and rear panels to form said tubular member into front and rear chambers,

means connecting with one end of said tubular member interconnecting said chambers in communicating relation,

conduit means connected with the other end of said tubular members for communicating each of said chambers with an area to be heated whereby fluid to be heated will flow through one of the chambers to the area to be heated, and will be returned through the other of said chambers,

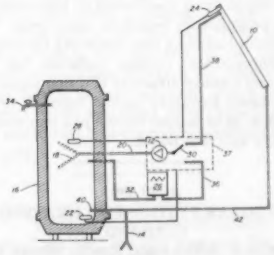
and first and second fibrous heat absorbers each being positioned in one of said chambers, the first fibrous heat absorber being positioned between the front and intermediate panels and being sufficiently porous to permit at least some solar energy to be transmitted therethrough whereby when said solar collector is attached to a structure, solar energy will be transmitted through the front panel to the first fibrous heat absorber, and through the first fibrous heat absorber and the intermediate panel to heat both fibrous heat absorbers from solar energy to thereby transfer heat to fluid passing through said fibrous heat absorbers in said chambers.



4,257,397
SOLAR WATER HEATER

Jacques Gouyou-Beauchamps, Ville d'Avray, France, assignor to Saunier Duval, Rueil Malmaison, France

Filed Feb. 16, 1979, Ser. No. 12,794
Claims priority, application France, Feb. 20, 1978, 78 04674
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—427 10 Claims



1. A hot water heating apparatus for heating and storing hot water using solar radiation, comprising:

a hot water reservoir;

a solar heating element having a water input and a water output for heating water circulating therethrough,

fluid supply means for supplying said solar element with a water input;

fluid return means connecting said solar element output to said water reservoir;

an auxiliary heating unit, positioned external to said reservoir, said heating unit having a water input and a water output;

auxiliary supply means for fluidly connecting said reservoir with said heating unit input;

auxiliary return means for fluidly connecting said heating unit output with said fluid return means for returning heating unit heated water to said reservoir; and

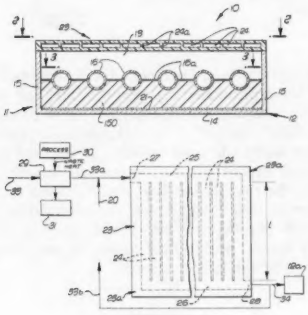
said fluid return means further including a single pump having a pump input and a pump output, for pumping water from said solar heating element and said auxiliary heating unit to said reservoir, and a selector valve for alternately connecting said pump input to said one of said solar element and said auxiliary return means.

4,257,398

HIGH EFFICIENCY SOLAR COLLECTOR

W. Keith R. Watson, El Camino Real (Box 1547), Rancho Santa Fe, Calif. 92067

Filed Mar. 26, 1979, Ser. No. 23,536
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—427 **14 Claims**



14. In solar apparatus, the combination comprising

(a) a solar collector having a side through which solar radiation enters the collector,

(b) first means operable to raise the ambient temperature at said side and through which solar radiation may pass, said first means defining transparent channel structure, said first means including supply means supplying relatively hot first liquid flowing through said channel structure, said first liquid being translucent or transparent and having been preliminarily heated by waste heat,

(c) the collector including heat absorbing ducting located to receive impingement of solar radiation that has passed through said channel structure and first liquid, and

(d) second means to supply second liquid to flow through said ducting, to be heated therein to a temperature higher than that of said first liquid.

4,257,399

HYDRO-SOLAR SYSTEM FOR HEATING AND COOLING

David E. Shonerd, 6 Golden State, Rancho Mirage, Calif. 92270

Filed Nov. 13, 1978, Ser. No. 959,607
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—429 **3 Claims**

1. A hydro-solar system for heating and cooling rooms in a building, including, in combination:

(a) water storage tanks in side by side relationship;

(b) means defining air ducts between the tanks communicating with said rooms and having common walls with said water storage tanks so that heat transfer takes place by conduction between water in the tanks and air in the ducts, the tanks and ducts being above the ceilings of the rooms below the roof of the building;

(c) a plurality of open elongated shallow water troughs on the building roof in side by side parallel relationship exposed to heat radiation from the sun;

(d) a thin cover sheet overlying said troughs so that water in the troughs is heated by thermal energy from the sun;

(e) pump, valve and conduit means interconnecting the storage tanks and troughs;

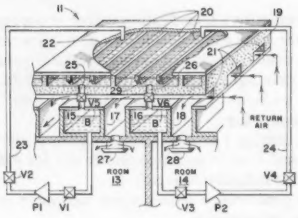
(f) a fan and air passage means for increasing air flow from the rooms through the air ducts and back to the rooms when high heating and high cooling are desired;

(g) control means for periodically transferring water from said storage tanks to said troughs and back to said storage tanks, said control means defining an off position, a low heat position, a high heat position, a low cool position and a high cool position;

(h) a sun sensor;

(i) a timer; and,

(j) connecting lines between the various positions on said control means, the sun sensor, timer, pump and value means and fan such that when the control means is set to either the high heat or high cool position, the fan is energized to increase air circulation to the air ducts and when the control means is set on either the low heat or low cool positions, the fan is turned off, the sun sensor controlling the pump and valve means to transfer water from the storage tanks to the water troughs at sun-up and transfer water from the water troughs to the storage tanks at sundown; and the timer means functioning to pass water from the storage tanks to the troughs at sundown and thence transfer water from the troughs to the storage tanks at sun-up, the sun sensor being activated when the control means is in either the low heat or high heat positions and the timer being actuated when the control means is in either the low cool or high cool positions, whereby water in said troughs heated by solar radiation during the day can be transferred to the storage tanks at sundown by the control means, the heat therein being transferred to air in the ducts to provide heated air for the rooms during the night, and whereby water in said troughs cooled by heat radiation therefrom into the night sky during the night can be transferred to the storage tanks at sun-up by the control means, heat in the air in the ducts being transferred to the water in the tanks to provide cooled air for the rooms during the day.



4,257,400

COMBINED ROOF AND SOLAR HEAT STRUCTURE

Lloyd E. Brumbaugh, 766 S. Johnson Rd., Ludlow Falls, Ohio 45339

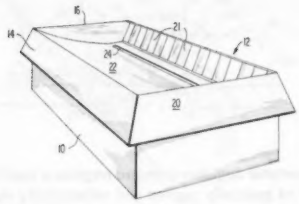
Continuation of Ser. No. 735,778, Oct. 26, 1976, abandoned. This application Jul. 20, 1979, Ser. No. 59,477
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—438 **5 Claims**

1. An integral building roof and solar heat collector structure comprising in combination:

a hollow rectangular box-like structure, closed at the bottom, open at the top, having its long axis oriented approxi-

mately in an east-west direction, and having outer sides which form peripheral roof surfaces so as to shed water and present from normal street level view the general appearance of a mansard-type roof;

a row of solar heat collector panels arranged in a common plane, with their tops parallel to and joined with the upper part of the north side of said peripheral roof surface, and with their bottoms at the bottom of said box-like structure;



a combination roof-reflector surface joining directly to the lowermost portion of said panels and extending to and joining directly to the upper part of the south side of said peripheral roof surface; and

means for draining water from the lowest portion of said combination roof-reflector surface.

4,257,401

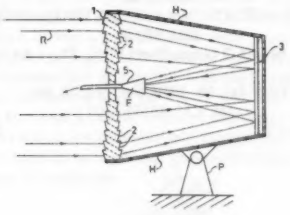
SOLAR HEAT COLLECTOR

Ronald M. Daniels, 112 Westhill Rd., Elliot Lake, Ontario, Canada P5A 1A7

Filed Jan. 2, 1980, Ser. No. 109,160

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—439 **11 Claims**



1. A solar heat collecting system comprising a lens having a focal length for focusing sunlight at a flat reflective surface which is spaced from said lens by half of said focal length, said flat reflective surface being positioned to reflect the sunlight back at the lens and to bring the sunlight to a focal point; symmetrical funnel means at said focal point, said symmetrical funnel means having an inwardly tapering reflective inner surface for funneling the sunlight to light piping means for piping the light to a boiler where the sunlight is converted to thermal energy.

4,257,402

EVACUATED SOLAR RECEIVER UTILIZING A HEAT PIPE

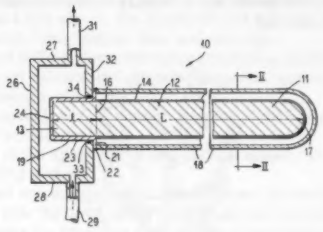
William J. Westerman, II, Waterloo, Iowa, assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Filed Sep. 26, 1979, Ser. No. 79,073

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—443 **14 Claims**

1. A solar receiver which requires no liquid in the heat receiving region comprising an elongated member of high thermal conductivity having a heat receiving portion which extends for a substantial portion of its length and a heat transfer portion which receives the heat from said heat receiving portion and transfers it for utilization, a hollow ceramic or glass member in intimate surface contact with said heat transfer portion of said elongated member, an elongated glass envelope enclosing said heat receiving portion and attached to said



ceramic or glass member to form an airtight seal, and a manifold with liquid therein into which said ceramic or glass member and said heat transfer portion extends for transferring heat to said liquid.

4,257,403

PLANE SOLAR ENERGY COLLECTOR WITH MILTICELLULAR TRANSPARENT COVER

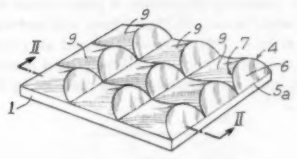
Laurent P. Chevalier, Quartier de la Garde, Route de Veynes, 05000 Gap, France

Filed Nov. 8, 1978, Ser. No. 958,621

Claims priority, application France, Nov. 10, 1977, 77 34377

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—449 **11 Claims**



1. A plane solar energy collector comprising a caloric absorber in which flows a heat-carrying fluid and a multicellular transparent cover of substantially constant thickness, comprising a plurality of juxtaposed identical cells each cell comprising a polygonal base frame, a substantially plane face which is defined by a first side of the said base frame and by a bow-shaped curve crossing the two ends of the first side and a convex transparent surface of which the convexity is directed towards the outside of said collector, which surface is connected to each of the remaining sides of each said polygonal base frame and to said bow-shaped curve thereby forming said individual cells.

4,257,404

REFLECTOR CONNECTORS

Hy Steinberg, 7200 NW. 78th St., Tamarac, Fla. 33319

Filed Jun. 11, 1979, Ser. No. 47,135

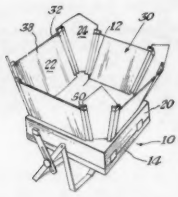
Int. Cl.³ F24J *3/02*

U.S. Cl. 126—451 **2 Claims**

1. In a solar oven including an insulated body defining a heating compartment with an opening at one end and an essentially flat collector plate connected within the heating compartment for receiving concentrated solar energy, and reflective panel means positionable at an angular relationship with the collector plate for concentrating substantially all of the solar energy entering the oven onto the collector plate, said

reflective panel means having alternative rectangular members and trapezoidal members, the improvement comprising:

guide means for connecting adjacent edges of said alternate rectangular and trapezoidal members, said guide means having two opposed channel portions whereby adjacent reflective panels are in registry with respective channel portions; and



means for securing said alternate reflective panel members to said guide means,

said means for securing is a locking means,

said guide means has an extension portion which removeably connects to said lock means.

4,257,405

BONE GRAFT MATERIALS

James Colville, Foxrock Co. Dublin, Eire, Ireland

Filed Feb. 6, 1979, Ser. No. 9,896

Int. Cl.[3] A61B *19/00*

U.S. Cl. 128—1 R **2 Claims**

2. A method for repairing a sketetal defect in the body, which comprises grafting bone graft material into the defect, said material consisting essentially of pure carbon formed by carbonizing wood in an inert atmosphere, said carbon having a porosity of at least 30% total volume and an average pore diameter of at least 30 microns, whereby said material is absorbed by the body after grafting, being replaced by fresh bone growth.

4,257,406

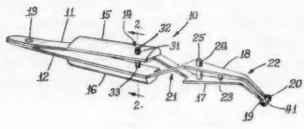
IRIS RETRACTOR AND PUPIL DILATOR

Alan G. Schenk, 8149 W. Ogden Ave., Apt. 6, Lyons, Ill. 60534

Filed May 18, 1979, Ser. No. 41,002

Int. Cl.[3] A61B *17/02*

U.S. Cl. 128—20 **8 Claims**



1. An instrument adapted for use in ophthalmic surgery comprising:

a pair of outwardly convex curved iris retracting and pupil dilating tips adapted to be mutually separated in a plane defining a plane of motion;

curved lip means formed on upper and lower edges of each of said tips and joined by an inwardly concave external surface adapted to capture and retain the margin of an iris lying within said defined plane as said tips are increasingly separated and retracted; and

handle means attached to said tips for effecting mutual separation thereof.

4,257,407

NEGATIVE PRESSURE RESPIRATOR SHELLS

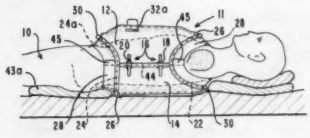
Pier G. Macchi, 3 French St., Burwood, Victoria, Australia

Filed Oct. 19, 1978, Ser. No. 952,773

Claims priority, application Australia, Oct. 21, 1977, PD2154; Feb. 9, 1978, PD3315

Int. Cl.[3] A61H *31/02*

U.S. Cl. 128—30.2 **13 Claims**



1. A portable negative pressure respirator shell comprising a plurality of generally curved and substantially rigid shell sections cooperable to provide an open ended shell which embraces a patient's torso when worn by the patient, being positioned to extend downwardly from over the chest about the diaphragm and abdomen to define a chamber between the shell and the patient's torso, port means to permit application of a negative pressure to said chamber, and resilient flexible sealing lips formed of overlaid strips of resilient material of successively reducing width disposed along longitudinally spaced edges of the shell sections which bound the open ends of the assembled shell, said lips being of outwardly increasing flexibility, thereby to aid in providing an airtight engagement with the body surface of the patient on the application of a negative pressure to said chamber.

4,257,408

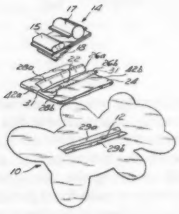
CUSHIONED STRUCTURE AND METHOD OF TESTING THEREOF

Carol Ramey, 6413-1/2 Ocean Front Walk, Playa del Rey, Calif. 90291

Filed Jul. 10, 1979, Ser. No. 56,249

Int. Cl.[3] A61H *1/00*

U.S. Cl. 128—32 **23 Claims**



1. A vibratory cushioning means comprising:

an outer shell formed with a first access opening;

a pocket unit affixed to said outer shell at said first access opening and having flexible walls extending inwardly to the interior of said outer shell and having a second access opening in communication with said first access opening of said outer shell;

a self-contained pressure activated vibratory means located within said pocket unit;

fastener means for closing said first access opening; and

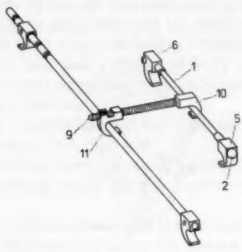
filler material filling the interior of said outer shell between pressure limits sufficient to substantially conform said flexible walls to said vibratory means under pressure from said filler material but of insufficient pressure to activate said vibratory means.

4,257,409

DEVICE FOR TREATMENT OF SPINAL CURVATURE

Kazimierz Bacal, ul. Akademicka 8, Zielona Gora, and Lech Wierusz, P1. Browarniany 2, Swiebodzin, both of Poland

Filed Apr. 9, 1979, Ser. No. 28,424
Claims priority, application Poland, Apr. 14, 1978, 206130
Int. Cl.[3] A61F *5/00*
U.S. Cl. 128—69 **1 Claim**



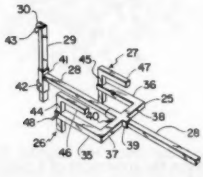
1. In a device for treatment of spinal curvature comprising a distraction spacer adapted to be attached to the extreme vertebrae of the spinal curvature, a longitudinal contractor comprising a rod having hooks at its opposite ends, said hooks being adapted to be attached to the most displaced vertebra of the curvature, one of said hooks being fixed to said rod and the other of said hooks being slidable along said rod, and a transverse contractor comprising a threaded bar having a stationary hook at one end engageable with said rod and slidable hook at the other end engageable with said distraction spacer, the improvement wherein one end of said rod of said longitudinal contractor has two parallel end pieces which are displaceable outwardly to prevent outward longitudinal displacement of the slidable hook of said longitudinal contractor, and said slidable hook of said transverse contractor is provided with a tiltable grip for engaging said threaded bar, said grip having a partially threaded hole engageable with the threads of said bar, and on an axis intersecting the axis of said hole, an obliquely cut inner face and a cutout opposite said inner face defining spaced ears which are bendable into engagement with said bar to fix said slidable hook of said transverse contractor in position on said threaded bar.

4,257,410

TRACTION DEVICE

Dale Flewelling, Moville, Iowa 51039

Filed Dec. 31, 1979, Ser. No. 108,648
Int. Cl.[3] A61H *1/02*
U.S. Cl. 128—75 **6 Claims**



1. An improved traction device for use with a patient support apparatus, the device being of the type having a rotatable pulley adapted to receive and support a flexible line extending between the body of a patient and a weight, an axle rotatably supporting the pulley and a support structure for said axle, the movement wherein said support structure includes

a generally U-shaped, substantially rigid frame having two side legs and an interconnecting portion lying in a plane which, in use, is generally horizontal;

a first hollow, elongated sleeve attached to said interconnecting portion and extending generally parallel with said side legs;

an elongated, horizontal support member slidably received in said first sleeve, the length of said horizontal support member being greater than said side legs;

a second hollow elongated sleeve attached to said horizontal support member and extending perpendicular to the plane containing said frame;

an elongated vertical support member slidably received in said second sleeve;

means at the upper end of said vertical support member for holding said axle;

first and second generally L-shaped brace members;

means near the distal end of each of said side legs defining an opening for receiving a leg of one of said brace members with the other leg thereof extending parallel with its associated side leg toward said interconnecting portion; and

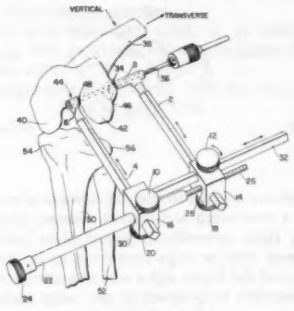
means on said first and second sleeves for selectively restraining said horizontal and vertical support members, respectively, against longitudinal motion through said sleeves.

4,257,411

CRUCIATE LIGAMENT SURGICAL DRILL GUIDE

Kenneth O. Cho, 1234 - 19th St. N.W., Washington, D.C. 20036

Filed Feb. 8, 1979, Ser. No. 10,197
Int. Cl.[3] A61F *5/04*
U.S. Cl. 128—92 EB **4 Claims**



1. A surgical tool adapted to be temporarily mounted to the distal end of a femur to allow precise drilling of a bony tunnel through a femoral condyle to a precise exit location on a femoral surface, said tool comprising:

a first longitudinally extending upright and a second longitudinally extending upright, with the distal end of the first upright including a first drill sheath and the distal end of the second upright including a second drill sheath, each of said sheaths defining a transversely extending guide for a drill, wherein each drill sheath has a serrated edge operable to fix the drill sheaths upon said condyle during a transverse contraction; and,

first and second clamp assemblies, with said first and second uprights being respectively supported thereby, wherein said first upright is longitudinally slideable with respect to said first clamp assembly, and said second upright is longitudinally slideable with respect to said second clamp assembly; and,

mounting means adjustably interconnecting said first and second clamp assemblies to allow a transverse relative movement between the clamp assemblies supporting said uprights, said mounting means further comprising a non-

circular guide bar extending transversely between the respective clamp assemblies, and parallel to the drill guide defined by said sheaths and a screw means to transversely contract said clamp assemblies relative to each other, and upon said guide bar, whereby said second sheath can be placed within the intercondylar notch and said first and second sheaths can be transversely adjusted against a femoral condyle,

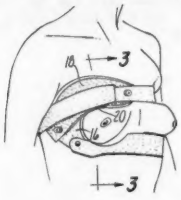
wherein further said first drill sheath is sufficiently elongated in the transverse direction to accurately guide a drill bit that is inserted into said first drill sheath towards an exit point which is directly at the contact of said second drill sheath with said femoral surface.

4,257,412

MASTECTOMY BRACE

Anne Guttentag, 39 N. Main St., New Hope, Pa. 18938

Filed Nov. 4, 1977, Ser. No. 848,610
Int. Cl.³ A61F *5/30*
U.S. Cl. 128—112 **6 Claims**



1. An appliance adapted to alter the attitude of projection of a breast in a downward and inward manner, comprising: a substantially rigid, generally U-shaped plate having a first section formed with an edge contoured to conform to the upper surface of the breast and a second section formed with an edge contoured to conform to the outer surface of the breast, the two sections being joined by a concave edge adapted to adjoin and partially surround the nipple area, and an adjoining section contoured to extend over the chest areas on the upper and outer side of the breast; and an elongated strip having mating separable fastener means on its opposed ends and means formed on one end for joinder to said first section of the plate, and a second strip having one end secured to a mid-point of the first strip and means on its other end for joinder to said second section of the plate, whereby the plate may be secured in pressured contact with the upper and outer surfaces of the breast to produce downward and inwardly directed forces on the breast by wrapping the first strip about the chest of the wearer and joining its ends with said separable fasteners.

4,257,413

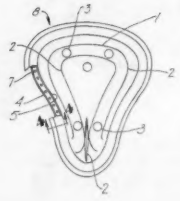
Patent Not Issued For This Number

4,257,414

ATHLETIC PROTECTOR CUP

Paul B. Gamm, Cincinnati, Ohio, and Elwood Strohm, Fort Thomas, Ky., assignors to Jung Products, Inc., Cincinnati, Ohio

Filed Jun. 28, 1979, Ser. No. 53,070
Int. Cl.³ A61F *5/40*
U.S. Cl. 128—160 **9 Claims**



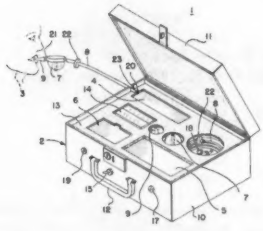
1. An athletic protector comprising an essentially rigid cup having a body of a size to enclose the genitals of the wearer, a plurality of closely spaced apart perforations extending about the periphery of the cup, a flexible resilient material molded to the periphery of the cup to provide a peripheral binding, the binding material overlying said perforations on both the outer and inner surfaces of the cup, with portions of the binding material extending through the perforations to form interlocks integrally joining the portions of the binding lying on opposite sides of the cup.

4,257,415

PORTABLE NEBULIZER TREATMENT APPARATUS

Howard Rubin, 1937 Nester St., Philadelphia, Pa. 19115

Filed May 7, 1979, Ser. No. 36,320
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—200.21 **7 Claims**



1. An apparatus for the treatment of a patient having a respiratory ailment with a medication, which apparatus comprises an outer portable case, said case being provided with a cavity for containing means for supplying a fluid, under pressure, to the patient, the means for supplying a fluid comprising

a compressor adapted to supply a fluid;

nebulizing means adapted to contain the medication therein and connected to the compressor to receive fluid therefrom, which fluid is caused to interact with the medication

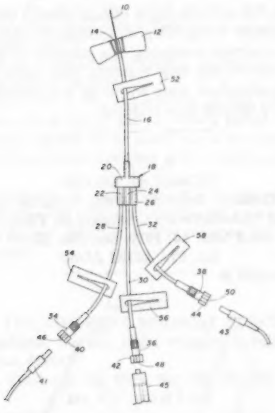
within the nebulizing means, thereby nebulizing the fluid;
means for introducing the nebulized fluid into the patient, which introducing means is connected to the nebulizing means;
electrical circuit means including a battery for operating the compressor, which electrical circuit means is electrically connected to the compressor,
a portable fail-safe means comprising a jack portion projecting exteriorly of the case and connected in said electrical circuit means in series between the compressor and the battery and plug means including terminals removably inserted into said jack portion, whereby said battery is connected to said compressor only upon inserting the plug into the jack portion;
the electrical circuit means and the compressor being maintained internal of the case, and
portable switching means, mounted externally to the case, which switching means controls operation of the compressor;
wherein the nebulizing means and the introducing means are internal of the case when not in use, and are external of the case when in use whereby the apparatus is capable of being carried and operated during ambulatory periods of the patient, and during ambulation of that patient.

4,257,416

MULTI-CHANNEL VENIPUNCTURE INFUSION SET

David Prager, 1394 N. 39th Street, Allentown, Pa. 18104

Filed May 3, 1979, Ser. No. 35,608
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214 R **10 Claims**



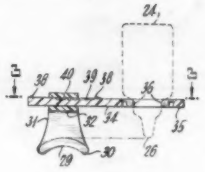
1. A multi-channel infusion set comprising a multiple passage manifold having first, second, third and fourth passages in permanently open communication, a venipuncture needle tube connected to said first manifold passage, at least three inflow tubes having one end thereof connected to said second, third and fourth manifold passages, respectively, female flanged adaptors connected to the opposite ends of each of said inflow tubes, and pinch-type closure means operatively associated with each of said needle tube and inflow tubes for selectively pinching each of said tubes closed.

4,257,417

ADJUSTABLE EYEDROPPER-BOTTLE HOLDER

Kenneth J. Gibilisco, Warminster, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 31, 1979, Ser. No. 62,585
Int. Cl.³ A61M 1/00
U.S. Cl. 128—233 **3 Claims**



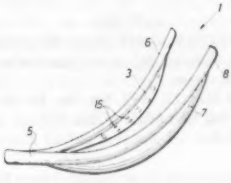
1. An adjustable eyedropper-bottle holder for use in conjunction with a squeeze-type eyedropper bottle for accurate dispensing of eyedrops, comprising a slidably adjustable nose-bridge rest and a bottle-holding slide bar, said nose-bridge rest being integrally attached to a hollow slide channel by means of a vertical spacer bar, said bottle-holding slide bar shaped to slide in close fitting relationship in said hollow slide channel, and having means at one end to receive and hold an eyedropper bottle.

4,257,418

DEVICE FOR ABSORBING URINE WITH INCONTINENT PERSONS

Hans Hessner, Djursholm, Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

PCT No: PCT SE78/00005 §371 Date Feb. 23, 1979, §102(e) Date Jan. 22, 1979, PCT Pub. No. WO. 79/00008 PCT Pub. Date Jan. 11, 1979
This PCT application filed Jan. 22, 1979, Ser. No. 21,602
Int. Cl.³ A61F 5/44
U.S. Cl. 128—286 **14 Claims**

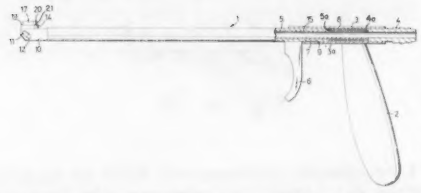


1. A device for absorbing urine adapted to be worn by incontinent adults, comprising a holder for multiple use, and a disposable diaper separate from but suited to and removably carried in the holder, the holder having a perforated inner part of a thin flexible material with a curved shape, bearing against the body shape of the wearer, with an upwardly wider portion in relation to the wearer and a downwardly tapering portion with reinforcement of a flexible material running along the outer contours, said material having such stability that a curved form is maintained; and an outer part of thin flexible material with substantially the same shape as the inner part and attached to the downwardly tapering portion of the inner part, said outer part having reinforcement running along its outer contour; and the diaper being retained between the inner and outer parts and having a shape corresponding to that of the inner part, and being composed of an absorption core and a liquid-permeable material enveloping the absorption core.

4,257,419
SUCTION-ASSISTED HEMORRHOID LIGATOR

Ewald Göltner, Fulda; Karl-Heinz Lurz, Künzell, both of Fed. Rep. of Germany, and Gerhard Schneider, Älta, Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Dec. 14, 1978, Ser. No. 969,613
Int. Cl.[3] A61B *17/00, 17/12*
U.S. Cl. 128—303 A **11 Claims**

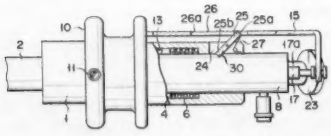


1. A ligator for pinching off hemorrhoids and similar body tissues at a body link portion thereof, comprising, in combination, a tubular housing; a suction tube fixedly mounted on the housing; and an actuator sleeve slidably mounted for reciprocable movement within the housing along the suction tube; a suction cup defining an open suction cavity having a volume approximating the size of the hemorrhoid to be pinched off and facing outwardly and to one side, fixedly attached to and in flow communication with the suction tube, for sucking a hemorrhoid into the suction cavity; the suction cup having means for receiving an elastic ring about the periphery of the open suction cavity; and means for ejecting said ring from the cup and onto the body link portion of a hemorrhoid sucked into the suction cavity and projecting from the cavity; said ejecting means being movable by reciprocation of the actuator tube between nonactuated passive and actuated ring-ejecting positions; the outer end of the actuator sleeve having fixed thereto a bifurcated support attached at its base end to the sleeve for reciprocable movement therewith, and with an inclined slot in each bifurcation, the slots capturing projections on the external periphery of the ejecting means slidably mounting the ejector on the support.

4,257,420
RING APPLICATOR WITH AN ENDOSCOPE

Toshiki Terayama, Kodaira, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 22, 1979, Ser. No. 41,339
Int. Cl.[3] A61B *17/12, 1/00*
U.S. Cl. 128—303 A **6 Claims**



1. A ring applicator comprising:

an operation unit having one end and another end opposite to said one end;

an outer tube coaxially arranged with the operation unit and having one end thereof connected to said one end of the operation unit and the other end thereof open;

an inner tube reciprocatingly inserted into the outer tube and having one end protruding from and drawn into the outer tube at said other end of the outer tube and the other end open;

a rubber ring removably mounted on an outer periphery of said one end of the inner tube;

an endoscope comprising a proximal end portion and a distal end portion fixed thereto and having a channel extending therethrough and reciprocatingly inserted into the inner tube, said channels having one end adjacent to said one end of the inner tube;

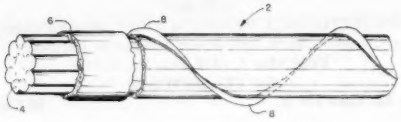
a forceps reciprocatingly inserted into the channel in the endoscope and adapted to be opened when the forces protrudes from said one end of the channel; and

an operation device reciprocatingly mounted on the operation unit and including means to pull at first only the forceps into the channel of the endoscope for a predetermined length to close the forceps, then move the endoscope as well as the forceps toward the operation unit relative to the inner tube to draw the forceps into the inner tube and thereafter move the inner tube as well as the endoscope toward the operation unit relative to the outer tube for allowing said other end of the outer tube to push the rubber ring for removal of the rubber ring from the inner tube, as the operation device is being moved toward said other end of the operation unit.

4,257,421
GASTRO-INTESTINAL TUBE GUIDE AND STIFFENER

Charles B. Beal, Menlo Park, Calif., assignor to Health Development Corporation, Mountain View, Calif.

Filed Jan. 10, 1979, Ser. No. 2,362
Int. Cl.[3] A61M *25/00*
U.S. Cl. 128—348 **5 Claims**

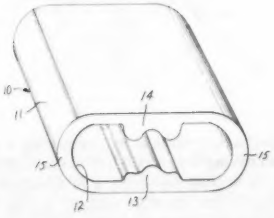


1. A guide for introducing a tubular device into a selected body passageway comprising an elongated core member of flexible base material consisting of a plurality of threads and a soluble coating on said base material, said coating characterized in its undissolved state by being less flexible than said tubular device flexible base material.

4,257,422
SURGICAL DRAIN

Patricia E. Duncan, Bayport, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 14, 1979, Ser. No. 20,437
Int. Cl.[3] A61M *27/00*
U.S. Cl. 128—350 R **3 Claims**



1. A surgical drain tube defined by a tubular member of a flexible and pliable material, said tubular member comprising a top wall portion, a bottom wall portion and side wall portions defining a lumen which is normally substantially oval in cross-section with said wall portions having an inner and outer

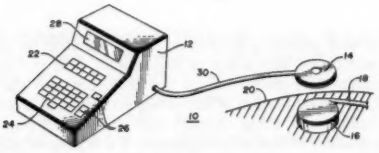
surface, wherein said top wall portion has at least one tongue portion on the inner surface of said top wall portion extending substantially the length of said lumen and said bottom wall portion has at least one groove member on the inner surface of said bottom wall portion extending substantially the length of said lumen, said groove member disposed opposite said tongue member such that when a change in pressure occurs causing said lumen to collapse said tongue member releasibly seats in said groove member thereby forming a plurality of laterally disposed lumens, and wherein said side wall portions are thicker in cross-section than the thinnest region of said top wall portion and the thinnest region of said bottom wall portion.

4,257,423

MEDICAL DEVICE

Ray S. McDonald, St. Paul, and Martin A. Rossing, Anoka, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 6, 1978, Ser. No. 957,965
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PG **21 Claims**



1. In a programmable medical device responsive to a detected programming signal consisting of a series of pulses coded in a binary number system in which said signal consists of pulses which are separated by either a first time period or a second time period which is shorter than said first time period, said first and second time periods respectively manifesting one or the other binary digits, the improvement comprising:

clock means for providing clock pulses at a known rate having a further time period between pulses less than said second time period;

counter means including a plurality of resettable stages for counting said clock pulses;

means responsive to the occurrence of said detected programming signal pulses and said clock pulses for resetting said counter means to an initial count at a time after the occurrence of each detected programming signal pulse; and

means responsive to said detected programming signal pulses for storing a data bit manifested by a certain stage of said counter means at a time prior to the resetting of said counter.

4,257,424

X-RAY TRANSPARENT MEDICAL ELECTRODE

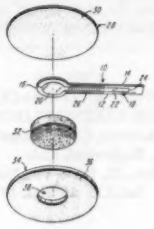
James V. Cartmell, Dayton, Ohio, assignor to NDM Corporation, Dayton, Ohio

Filed Apr. 30, 1979, Ser. No. 34,394
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—641 **9 Claims**

1. A medical electrode comprising:

a flexible, resilient, nonconductive sheet member having an outer margin, an adhesive layer on one face thereof, and having an aperture extending therethrough;

an X-ray transparent conductor comprising a flexible, elongate, dimensionally stable, nonconductive plastic film, having a surface confronting the opposite face of said sheet member, a layer of conductive silver paint adhered to said surface of said film confronting said sheet member and having a first exposed conductive portion aligned with said aperture and a second exposed conductive portion disposed outwardly beyond said outer margin of said sheet member, and further comprising a continuous insulating covering over said paint between said exposed portions engaging said sheet member and extending beyond said outer margin thereof;



a gel filled sponge extending through said aperture engaging said first exposed conductive portion and projecting beyond said one face of said sheet member; and

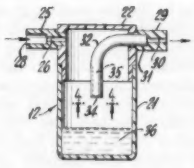
means securing said conductor to said sheet member and said sponge.

4,257,425

BIOPSY SPECIMEN COLLECTOR

James P. Ryan, Weymouth, Mass., assignor to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Jun. 4, 1979, Ser. No. 45,034
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—758 **6 Claims**



1. A biopsy specimen collector capable of use in any orientation and adapted for use with a vacuum source comprising:

a receptacle including a cover portion having a transverse wall and a sidewall projecting from and extending about the periphery of said transverse wall and having an open end;

the edge of the sidewall surrounding the open end of the cover portion having a recess for receiving a collection portion;

said sidewall further including an inlet opening and an outlet opening therethrough;

an inlet tube disposed in said inlet opening and having a first bore extending from its distal end part way through said inlet tube and having a second bore extending from said first bore through said inlet tube to the inside of said cover portion;

an outlet tube disposed in said outlet opening and having a first bore extending from its distal end part way through said outlet tube and having a second bore extending from said first bore through said outlet tube into the interior of said cover portion;

a curved tube having a first end disposed in said second bore of said outlet tube and having a second end extending in a direction away from said transverse wall of said cover portion;

said receptacle including a collection portion having a transverse wall and a sidewall projecting from and extending about the periphery of said collection portion transverse wall and having an open end;

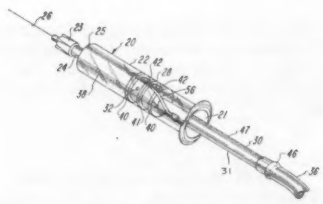
the periphery of said collection portion sidewall adapted to mate with the recess on the edge of the cover portion sidewall so that the cover portion and collection portion are tightly engaged together to form a receptacle wherein the interior boundaries of said receptacle define a geometric configuration, the open end of said curved tube being located substantially at said geometric centroid.

4,257,426

VACUUM ASSISTED ANTI-COAGULANT SYRINGE DEVICE FOR TAKING BLOOD SAMPLES

Donald L. Bailey, Thornton, Colo., assignor to Marquest Medical Products, Inc., Englewood, Colo.

Filed Jun. 22, 1979, Ser. No. 50,970
Int. Cl.[3] A61B 5/14
U.S. Cl. 128—766 **4 Claims**



1. A syringe device of the type used for drawing blood samples, the device having a generally tubular body with an open rearward end and a forward end adapted to receive a hypodermic needle in a manner to establish fluid communication between said needle and the interior of said tubular body, a plunger adapted to be slidably positioned within said tubular body to define a preselected volume within the tubular body, said plunger including a hollow elongated body, a resilient sealing member rotatably connected to the elongated body having a vent therethrough in communication with the hollow interior of said plunger body, and seal interruption means allowing communication between the vent of said sealing member and the interior of said tubular body forwardly of said sealing member, a flexible hose operably connected to said elongated body to establish fluid communication between the interior of said elongated body and the flexible hose, and vacuum pump means operatively connected to said hose whereby pressure can be lowered within the interior of said tubular body forwardly of said sealing member to thereby draw blood into the syringe when said seal interruption means is operative to allow communication between the vacuum pump means and the interior of said tubular body forwardly of said sealing member.

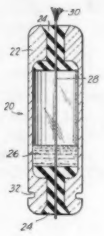
4,257,427

METHOD FOR COLLECTING BODY FLUIDS

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Division of Ser. No. 746,827, Dec. 2, 1976, Pat. No. 4,186,730, which is a continuation-in-part of Ser. No. 534,893, Dec. 20, 1974, Pat. No. 3,998,211, which is a continuation-in-part of Ser. No. 499,925, Aug. 23, 1974, Pat. No. 3,934,575, and Ser. No. 499,926, Aug. 23, 1974, Pat. No. 3,924,607, each is a division of Ser. No. 329,862, Feb. 5, 1973, Pat. No. 3,842,166. This application Sep. 13, 1979, Ser. No. 75,249
Int. Cl.[3] A61B 10/00
U.S. Cl. 128—769 **1 Claim**

1. In a method for collecting fluids from the body of a human being or animal, the steps of positionally arranging an enclosure in juxtaposition to a cavity of the body which at least at times contains body fluid in such manner that when the body fluid is present in the cavity the enclosure is in contact with the body fluid, said enclosure having within itself a hollow interior for receiving the body fluid while shielding the body from the interior of the enclosure, enclosing within the enclosure an agent which includes at least as a part thereof a nutrient for promoting the growth of certain microorgansims which may be present in the collected body fluid, creating between the interior of the enclosure and the body fluid conditions for transfer of the microorganism to the nutrient comprising a string which initially has a portion exposed at said part of said enclosure to receive said microorganism if it is present at said location, said string extending through a closed wall portion of said enclosure and being capable of being pulled though said



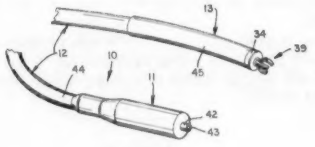
closed wall portion at least to an extent sufficient for placing said portion of said string in engagement with the nutrient subsequent to introduction of the enclosure into the body cavity with said portion of said string situated at said location, and pulling said string through said closed wall portion to effect transfer of said microorganism, if it is present, into said enclosure, so that thereafter when the enclosure is separated from the body cavity, the microorganisms, if present in the body fluid, will be situated in the interior of the enclosure.

4,257,428

RETRACTABLE STIMULATION ELECTRODE APPARATUS AND METHOD

Steven A. Barton, 401 S. Brazosport Blvd., Freeport, Tex. 77541, and Steven G. Anderson, 107 Poinciana St., Lake Jackson, Tex. 77566

Continuation-in-part of Ser. No. 858,954, Dec. 9, 1977, Pat. No. 4,136,701. This application Oct. 16, 1978, Ser. No. 951,726
The portion of the term of this patent subsequent to Jan. 30, 1997, has been disclaimed.
Int. Cl.[3] A61N 1/04
U.S. Cl. 128—785 **7 Claims**



1. Retractable tissue-engaging electrode apparatus, comprising:

an electrically conductive signal lead means;

electrode body means connected to said signal lead means and having a conductive portion intended for signal transfer contact with body tissue;

tissue-engaging means associated with said electrode body means and operative to selectively engage body tissue, said tissue-engaging means having an extended position and a retracted position and being operative to pinchingly engage body tissue with sufficient force to move said body tissue and said conductive portion into mutual engagement as said tissue-engaging means is moved from said extended position toward said retracted position; and

means within said electrode body means and operatively associated with said tissue-engaging means to selectably place said tissue-engaging means in either said extended

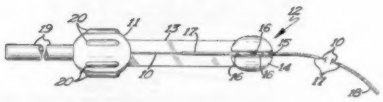
position or said retracted position, so as to selectively pinchingly engage said body tissue.

4,257,429

STYLET RETAINER AND EXTENSION

Eugene A. Dickhudt, New Brighton, and Duane J. Zytkovicz, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 7, 1979, Ser. No. 10,390
Int. Cl.[3] A61N 1/04
U.S. Cl. 128—786 10 Claims



1. In a medical electrode placement system of the type wherein a stylet is inserted within a flexible body portion of an electrode carrying lead to provide stability to the flexible lead body portion during electrode placement, the improvement which comprises knob means secured to one end of said stylet and lead engagement means mechanically connected to said knob means for engaging said flexible lead body portion to impart movement to the lead in accordance with manipulation of said knob means.

4,257,430

TOBACCO COMPOSITION INCLUDING PALLADIUM

Peter F. Collins; Herman G. Bryant, Jr., both of Durham, and James O. Pullman, Chapel Hill, all of N.C., assignors to Liggett Group Inc., Montvale, N.J.

Filed Feb. 21, 1979, Ser. No. 13,575
Int. Cl.[3] A24B 15/28, 15/42
U.S. Cl. 131—140 B 8 Claims

1. A method for the deposition of catalytically active metallic palladium on smoking tobacco comprising:

(a) Forming an aqueous solution containing a soluble palladium compound, and a compound capable of reducing ionic palladium cations to palladium metal, said solution having a pH of no more than 3;

(b) Heating said solution at an elevated temperature for a period of time sufficient to convert at least about 50 percent of the palladium to insoluble palladium; and

(c) Admixing the casing solution with tobacco to deposit thereon said insoluble palladium.

4,257,431

PROCESS FOR EXPANDING TOBACCO

Jackie L. White, Pfafftown, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Nov. 13, 1978, Ser. No. 959,977
Int. Cl.[3] A24B 3/18
U.S. Cl. 131—140 P 13 Claims

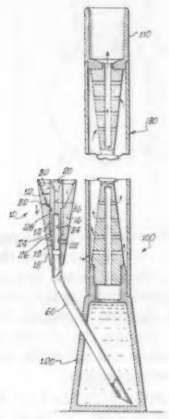
1. A process for expanding tobacco impregnated with an expansion agent which comprises contacting the impregnated tobacco with a quantity of hot inert solid particles for a time sufficient to effect rapid vaporization or expansion of said expansion agent with concomitant expansion of the tobacco and separating the expanded tobacco from said particles.

4,257,432

METERING DEVICE FOR FLAKED AND GRANULAR SOLIDS

Denis J. Griffith, 2412 Punta Del Este, and Scott M. Reddy, 1502 Elk Lane Dr., both of Hacienda Heights, Calif. 91745

Filed May 25, 1979, Ser. No. 42,561
Int. Cl.[3] A24F 1/30, 1/26
U.S. Cl. 131—173 10 Claims



1. A metering device for granular and flaky materials, comprising:

a bowl cavity member defining an upwardly facing metering cavity having an upper rim, said cavity being configurated and sized to meter a predetermined quantity of such materials,

means defining an open passage extending from the metering cavity for passage of finely divided material therethrough,

a hopper member movably mounted on the bowl cavity member and defining an upwardly facing material cavity,

upper stop means establishing an upper hopper limit position wherein the lower portion of the hopper material cavity is adjacent to the rim of said metering cavity, and

lower stop means establishing a lower hopper limit position wherein the rim of the metering cavity is substantially above said lower portion of the hopper material cavity and the level of material in the hopper material cavity,

whereby with the hopper in its upper limit position material therein is moved by gravity into the metering cavity and with the hopper moved to its lower limit position the rim of the metering cavity is above the material in the hopper.

4,257,433

WATER-DRIVEN TOOTHBRUSH AND WATER-PICK ASSEMBLY

Wong K. Kwan, North Point, Hong Kong, assignor to Well Men Industrial Co. Limited, Quarry Bay, Hong Kong

Filed Jan. 22, 1980, Ser. No. 114,195
Int. Cl.[3] A45D 24/00
U.S. Cl. 132—11 A 11 Claims

1. A water-driven toothbrush and water-pick assembly having a housing containing at least two water flow paths, a water turbine rotor located in a first of the at least two water flow paths, a first shaft mounted to pivot about its longitudinal axis, and an eccentric link interconnecting the rotor and first shaft for converting rotary movement of the rotor into pivotal movement of the first shaft, an elongated toothbrush arm for mounting a toothbrush head, which arm contains a water passage extending from a water-pick outlet adjacent the head end of the arm to the other end of the arm and is fixedly connectible at the other end of the arm to the first shaft for pivotal agitation therewith and to form part of a second of the at least

two water flow paths, and a handle containing a water inlet passage connectible to a source of water under gravity or pressure, and a water outlet passage, which handle is mountable on the housing for pivotal movement between at least first and second positions, so that when the water inlet passage is operatively connected to a source of water the handle can be pivoted into and out of the first position in which the water

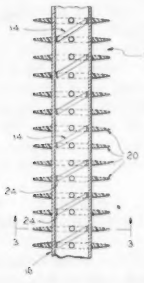
passes through the water inlet passage, along the first water flow path to rotate the turbine rotor and thereby pivotally agitate the toothbrush arm and head, and exit through the water outlet passage without actuating the water-pick, and into and out of the second position in which the water passes through the water inlet passage, the second water flow path, along the arm water passage and out of the water-pick outlet without actuating the toothbrush arm.

4,257,434

HEATED HAIR CURLING BRUSH

John Wahl, 1701 Locust St., Sterling, Ill. 61081

Filed Jul. 10, 1979, Ser. No. 56,256
Int. Cl.³ A45D *2/36*
U.S. Cl. 132—33 R **5 Claims**



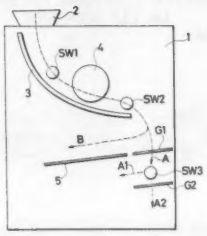
1. A heated hair curling brush comprising:
a handle;
a brush section attached to said handle; and
means comprising a source of power;
the brush section comprising a tubular member having a heating surface on the outside thereof, heating element means in direct contact with the inside surface of said tubular means and energized by said power source,
a plurality of comb rings placed in spaced relation over said heating surface of said tubular means; said heating surface having no exposed interruptions, between said comb rings, and
each said comb ring having one or more brush bristle-like points extending around the periphery thereof.

4,257,435

MISCHIEF PREVENTING DEVICE FOR A COIN SORTING MACHINE

Akio Tanaka; Yoshihisa Nakajima, and Shinji Yokomori, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jun. 6, 1978, Ser. No. 913,165
Claims priority, application Japan, Jun. 7, 1977, 52-66973
Int. Cl.³ G07D *3/16;* G07F *3/02*
U.S. Cl. 133—3 R **2 Claims**

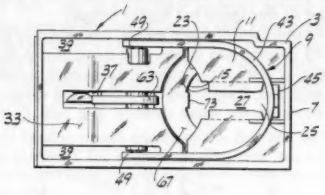


1. In a coin sorting and counting apparatus of the type including: coin sorting means for producing first and second coin sorting signals representing first and second true coin values, respectively, and for producing no coin sorting signal for a false coin; first coin detecting means located upstream of said coil sorting means for producing a first coin detection signal upon the passage of a coin; second coin detecting means located downstream of said coin sorting means for producing a second coin detection signal upon passage of a coin; first gate means located downstream of said second detecting means and responsive to the simultaneous occurrence of a true coin sorting signal and said second coin detection signal to direct a coin along a true coin path; the improvement comprising:
first and second flip-flop means for respectively storing first and second coin sorting signals which occur in the interval between the occurrences of said first and second coin detection signal;
third flip-flop means settable in a first state in response to the simultaneous occurrence of said second coin detection signal and a stored coin sorting signal in either of said first and second flip-flop means for producing a first gate control signal to open said first gate means to direct a coin along said true coin path;
third coin detection means located in said true coin path for producing a third coin detection signal upon the passage of a coin;
fourth flip-flop means having set and reset inputs and set and reset outputs;
means supplying said first and second coin sorting signals to said set and reset inputs, respectively;
first AND circuit means having two inputs coupled to said set output and to said third detection signal, respectively, for producing a first coin counting signal upon each simultaneous occurrence of a first coin sorting signal and a third coin detection signal;
second AND circuit means having two inputs coupled to said reset output and to said third detection signal, respectively, for producing a second coin counting signal upon each simultaneous occurrence of a second coin sorting signal and a third coin detection signal;
coin counting means for respectively counting the number of said first and second coin counting signals; and
means for applying said third coin detection signal to said third flip-flop means to reset it to a second state thereby removing said first gate control signal and closing said first gate means so that a counted coin cannot be withdrawn from said true coin path.

4,257,436
COIN DISPENSING APPARATUS HAVING A U-SHAPED COIN EJECTOR

Barry L. Smith, Florissant, Mo., assignor to UMC Industries, Inc., Stamford, Conn.

Filed Jul. 25, 1979, Ser. No. 60,465
Int. Cl.[3] G07D 1/00
U.S. Cl. 133—5 R 16 Claims



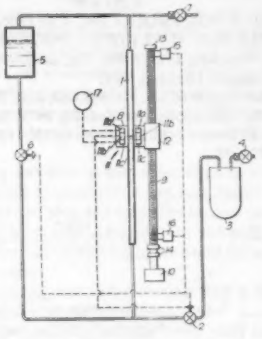
1. Coin dispensing apparatus comprising:
a base having a socket therein adjacent one end of the base constituting its rearward end, said socket being adapted to receive a tube for holding a stack of coins to be dispensed, the bottom coin of the stack bearing on the bottom of the socket for supporting the stack of coins;
an exit passage at the forward side of the socket for ejection of said bottom coin by sliding it forward off the bottom of the socket,
the bottom of the socket having a forward edge at the forward side of the socket, the bottom of the socket also having an opening adjacent the rearward side of the socket and a central slot narrower than said opening extending forward from said opening to said forward edge of the bottom of the socket;
said base having a bottom-opening recess forward of the socket into which the bottom coin slides as it is ejected, the coin dropping down out of said recess,
a coin ejector at the bottom of the socket movable forward away from a retracted position for ejecting the bottom coin, and
means for moving the ejector forward for ejecting the bottom coin and rearward back to said retracted position,
the ejector comprising a U-shaped member extending beneath the bottom of the socket and movable between a raised position toward the bottom of the socket and a lowered position away from the bottom, the U-shaped member opening toward the forward end of the base and having a T-shaped projection extending up from a central portion of its closed end, said projection being engageable with the rear of said bottom coin and comprising a stem adapted to extend up within said central slot when the ejector moves forward from its retracted position and a head at the upper end of the stem, the U-shaped member being in raised position with the head thereon being above the bottom of the socket when the ejector moves forward, the U-shaped member being in lowered position with the head thereon being below the bottom of the socket when the ejector moves rearward, the U-shaped member at its open end being wider than the coin to be ejected.

4,257,437
LIQUID FLOW CONTROL

William B. Pearson, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 19, 1979, Ser. No. 4,922
Claims priority, application United Kingdom, Feb. 8, 1978, 5044/78
Int. Cl.[3] G05D 7/00
U.S. Cl. 137—8 9 Claims

1. A method of controlling the rate of flow of liquid from a column through a valve which comprises moving a sensor for the level of liquid in the column along the column at a predetermined rate corresponding to the desired rate of flow of liquid through the valve, generating a signal from the sensor which represents the liquid level in the column relative to the

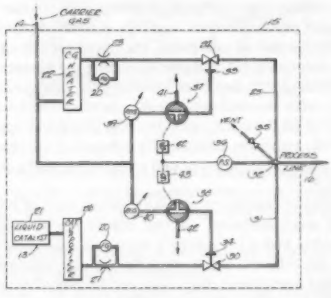


sensor, and controlling the opening and closing of the valve in response to the signal generated by the sensor whereby liquid flows through the valve at the desired rate.

4,257,438
BULK CATALYST PROPORTIONER

Donald V. Miller, N. 87 W. 15898 Bellview Blvd., Menomonee Falls, Wis. 53051

Filed Nov. 16, 1978, Ser. No. 961,179
Int. Cl.[3] F16K 19/00
U.S. Cl. 137—88 1 Claim



1. In apparatus for mixing first and second fluids in which the first fluid is a gas and the second fluid is a liquid and in which said liquid is vaporized to convert it to a gas and is then mixed with the first fluid in its gaseous state, the improvement for proportioning the two gases and comprising valve means for controlling the flow rate of both gases through variable valve separately before the gases are mixed, means for setting the variable valve for one gas to establish a flow rate for that gas at a given load level and means for setting the variable valve for the other gas to establish a flow rate for the other gas at the desired proportion between the flow rates of said gases at said given load level whereby drawing on the mixture of gases at said given load level or at reduced load levels maintain said proportion regardless of load level, said variable valves being provided with pressure actuated controllers to establish their settings, manually actuated pressure regulators for said controllers by which the initial settings are made and pressure relief valves by which said variable valves are concurrently relieved of pressure to close said valves, and means for actuat-

ing said pressure relief valves in response to gas pressure at the load.

4,257,439

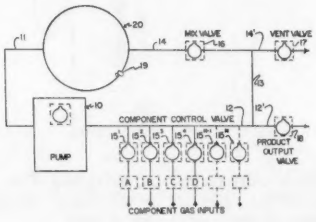
APPARATUS FOR PRODUCING CALIBRATION GASES SUITABLE FOR ANALYTICAL INSTRUMENTATION

Donald P. Mayeaux, Prairieville, La., assignor to Bi-M Instrument Company, Houston, Tex.

Continuation-in-part of Ser. No. 698,883, Jun. 27, 1976, Pat. No. 4,142,860. This application Jan. 26, 1979, Ser. No. 6,665

Int. Cl.[3] **F17D** *3/12;* **B01F** *15/04;* **G01N** *1/00;* **G05D** *7/06*

U.S. Cl. 137—88 **7 Claims**



1. Apparatus for producing a calibration gas mixture of known composition from a plurality of component gases separately introduced therein and blended together suitable for use in analytical instrumentation, which comprises

a pressure vessel, forming a gas mixing chamber, sufficient to provide a heat sink for holding the gas temperature substantially stable during the blending of the gases,

a pump the suction side of which is connected via a suitable conduit with the chamber of said pressure vessel,

a mix valve connected via a suitable conduit to the chamber of said pressure vessel and via another conduit to the discharge side of said pump, the pump providing a means for circulating gas, and homogenizing the mixture of gases introduced into said chamber when the mix valve is open,

a vent valve downstream of said chamber and located in a conduit on the discharge side of the pump and upstream of the mix valve for substantially exhausting said gas mixing chamber by operation of said pump when said mix valve is closed,

a plurality of component gas inlet valves, each of which is in fluid communication via said conduits with said mixing chamber and with a supply source of component gas of the gas mixture for controlling the introduction of the desired component gases into said mixing chamber,

a product output valve for withdrawal of a product gas blend, and

pressure transducer means for measuring the pressure of the gases in said mixing chamber, and producing an output signal for control of said pump and valves.

4,257,440

INJECTION PUMP FOR SPRINKLER SYSTEMS

Edwin J. Hunter, Rancho Santa Fe, Calif., assignor to The Toro Company, San Marcos, Calif.

Filed May 21, 1979, Ser. No. 41,006

Int. Cl.[3] **G05D** *11/035*

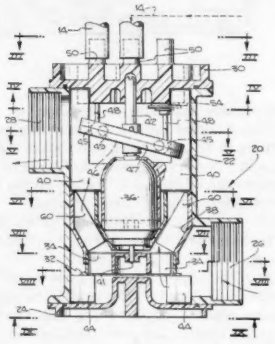
U.S. Cl. 137—99 **4 Claims**

1. An improved apparatus for injecting an additive into a stream of fluid for a sprinkler system having a plurality of sprinkler heads, the apparatus being of the type having a housing adapted for connecting to a source of fluid and an external source of additive and also having an outlet through which said intermixed fluid and additive pass, and pump means, disposed completely within said housing and driven by said source of fluid for drawing additive into said housing and for forcing said additive into fluid from said fluid source, wherein the improvement comprises:

fluid-driven turbine means, disposed within said housing in the path of the fluid passing through said housing, for converting a portion of the kinetic energy of said fluid flow into a rotary force;

transmission means, connected to and driven by said turbine means, for changing the high-speed, low-torque rotary force produced by said turbine means to a rotary force having slower speed but higher torque;

positive displacement pump means, connected to and driven by said transmission means, said pump means including a plurality of piston and cylinder means each in communication with and drawing additive from said external source and pumping the same directly into said fluid passing



through said apparatus at a rate determined by the speed at which said turbine means rotates

wherein said positive displacement pump means comprises:

a plurality of inlet means, located on the exterior of said housing, for routing additive from said external additive source into said housing;

chamber means, located above said transmission means and in the path of fluid flow from said source to said outlet;

said plurality of cylinder means communicating between said chamber means and said plurality of inlet means, for each collecting a quantum of additive from said inlet means;

and wobble pump means, driven by said transmission means for drawing each said quantum of additive present in each of said cylinder means directly into said chamber means.

4,257,441

TRANSMISSION THROTTLE VALVE OF AUTOMATIC POWER TRANSMISSION

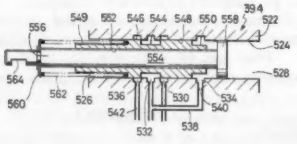
Kazuyoshi Iwanaga, Yokohama; Kazuhiko Sugano, Tokyo, and Kunio Ohtsuka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 12, 1978, Ser. No. 968,719

Claims priority, application Japan, Aug. 25, 1978, 53-102874

Int. Cl.[3] **G05D** *16/10*

U.S. Cl. 137—116.3 **2 Claims**



1. In a hydraulic control system for an automatic power transmission for an automotive vehicle including an accelera-

tion producing member movable into and out of a released position, a transmission throttle valve for producing a fluid pressure variable with the displacement of the acceleration producing member from the released position thereof, comprising:

a wall portion formed with a valve chamber having at least one open axial end;

a first movable member axially slidable through the valve chamber and formed with an axial bore which is open at both ends, the first movable member having a pressure acting area to be acted upon by said fluid pressure;

a second movable member axially slidable through the bore in said first movable member and mechanically engaging the acceleration producing member for being axially moved in a predetermined direction with respect to the wall portion; and

resilient biasing means engaging the first and second movable members for urging the first and second movable members to axially move in opposite directions relative to each other,

the direction in which the second movable member is urged to move by the biasing means being coincident with said predetermined direction, the second movable member having a laterally enlarged axial portion axially slidable in said valve chamber and forming a variable-volume space between the enlarged axial portion and said pressure acting area of the first movable member;

said first movable member having first and second lateral lands axially spaced apart from each other and arranged to be respectively closer to said open axial end and said enlarged axial portion of said second movable member;

the second movable member having an axial end portion constantly projecting from the axial bore in the first movable member and the valve chamber in the wall portion;

said resilient biasing means comprising a spring seat element fixedly mounted on said axial end portion of the second movable member and a helical compression spring seated at one end of said spring seat element and at the other end on the axially outer end face of said first lateral land; and

said pressure acting area of the first movable member being formed at least in part by the axially outer end face of said second lateral land.

4,257,442

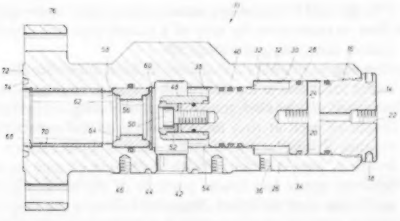
CHOKE FOR CONTROLLING THE FLOW OF DRILLING MUD

Jack R. Claycomb, 8226 Waynemen, Houston, Tex. 77040

Continuation-in-part of Ser. No. 727,031, Sep. 27, 1976, Pat. No. 4,190,073. This application Mar. 8, 1979, Ser. No. 18,508

Int. Cl.³ F16K *5/00*

U.S. Cl. 137—238 **10 Claims**



1. A choke for controlling the flow of mud which comprises:

a hollow valve body having a passage therethrough;

a valve seat having an encircling, tapered face surrounding an axial passage past said tapered face for directing mud flow past said tapered face within said valve body;

an encircling valve seat shoulder axially spaced from said tapered face lying in a plane perpendicular to the flow through said axial passage;

a valve element having an external tapered face conforming to said valve seat tapered face which said valve element, on movement, moves from a spaced position into a concentric, centrally positioned first throttling location within said valve opposite said valve seat tapered face and which said valve element and said valve seat tapered faces define a gap therebetween for throttling mud flow passing through the gap, and wherein said valve element controllably blocks the axial passage flow of mud past said valve seat on further movement of said valve element toward said valve seat shoulder defining a second throttling location having reduced flow compared to said first throttling location;

a surrounding shoulder on said valve element which shoulder is adapted to conform to and seat against said valve seat shoulder to plug and close the flow of mud through the gap between said valve element and said valve seat, said shoulder further moving toward said valve seat shoulder for closure;

means for moving said valve element into a fully closed position relative to said valve seat; and

inlet and outlet means communicating with said passage through said valve body.

4,257,443

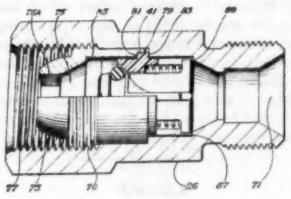
CHECK VALVE

Larry R. Turney, Denton, Tex., assignor to Victor Equipment Company, Denton, Tex.

Filed Dec. 15, 1978, Ser. No. 970,002

Int. Cl.³ F16K *15/06*

U.S. Cl. 137—269.5 **8 Claims**



1. An assembly for use as a check valve comprising:

a seat member having an opening extending therethrough,

a poppet member located in said opening for axial movement therein,

said seat member having an annular seat at a first end surrounding said poppet member,

an annular seal in surrounding engagement with said poppet member and adapted to engage said annular seat,

spring means engaging portions of said seat member and said poppet member for normally urging said poppet member in a first direction to urge said seal against said seat to form a seal therebetween,

the engagement of said seal with said seat preventing removal of said poppet member from said opening of said seat member through a second end opposite said first end,

said poppet member being adapted to be moved in a second direction opposite said first direction against the bias of said spring means to an open position to allow fluid to flow through said opening,

said poppet member having stop means adapted to engage stop means of said seat member when said poppet member is moved in said second direction to a given position to prevent removal of said poppet member from said opening of said seat member through said first end thereof;

slot means formed through wall structure of said seat member along a portion of the length thereof, and

said poppet member having rib means extending along a portion of the length thereof; said rib means being slidably

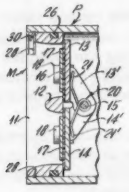
located in said slot means to prevent rotation of said poppet member and allowing axial movement thereof.

4,257,444

INSERT CHECK VALVE OR THE LIKE

Francis H. Ogle, Jr., Chardon, and Ernest R. Koppl, South Euclid, both of Ohio, assignors to Transamerica DeLaval Inc., Princeton, N.J.

Filed Apr. 6, 1979, Ser. No. 27,846
Int. Cl.[3] F16K *43/00*
U.S. Cl. 137—315 19 Claims



1. In combination, first means of conducting fluid flow and including a circular bore at an open end thereof, said bore having a circumferentially continuous annular groove therein at a location axially offset from said open end, and an insert valve removably seated in said bore; said insert valve comprising an annular body with a cylindrical outer surface sized for support in said bore in axial overlap with said groove, an externally open circumferential groove in said body and having sectional proportions substantially matching but radially opposed to those of the bore groove, one end of said body being locally recessed to an axial extent which includes said body groove, the angular limits of said recess being less than the remaining circumferential extent of said body groove, and a stiffly compliant circumferentially extensive retainer element substantially filling one of said grooves, and at least partially filling the other of said grooves, said retainer element being removably insertable via said recess into the annular volume defined by and between said grooves when in axial registry.

4,257,445

SHIELDED VENT PORT

Sanford L. Cook, Ocean, and Justin J. Molisani, Bricktown, both of N.J., assignors to Buildex Incorporated, Huntington, N.Y.

Filed Oct. 26, 1978, Ser. No. 954,968
Int. Cl.[3] F16K *15/02, 17/18, 49/00*
U.S. Cl. 137—341 12 Claims

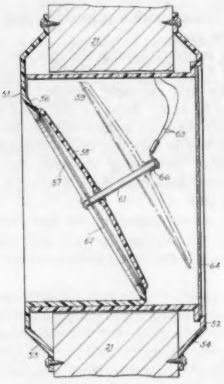
1. A pressure-equalization vent port for equalizing the pressure on opposed sides of an enclosure wall, comprising:

a frame shaped for fitting an opening in said wall, said frame having a conduit therethrough, said conduit having a top wall, a bottom wall, side walls and open ends;

a plate disposed within said conduit, the periphery of said plate being sealingly joined to said walls of said conduit to prevent the passage of air between said plate and said walls, said plate being sloped with respect to said top and bottom walls whereby said plate has upper and lower surfaces, said plate having a large aperture therethrough;

riser means in sheet-like form disposed against said upper surface of said plate at the periphery of said aperture for preventing flow of air through said aperture in a downward direction; and

spindle means disposed for permitting movement of said riser means in a direction essentially perpendicular to the plane of said plate at said aperture and upwardly therefrom for flow of air through said aperture only in said upward direction when the pressure on that end of said conduit proximate said lower surface of said plate is greater than at the other end of said conduit by an amount sufficient to overcome the weight of said riser means, said spindle means being mounted to said port in a direction essentially perpendicular to said plate, said riser means having a closely fitting aperture for passage of said spindle



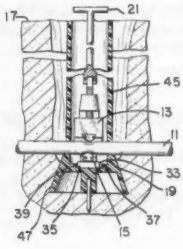
means therethrough and said spindle means having an expanded upper end for limiting the upward excursion of said riser means.

4,257,446

FLUID FLOW SHUT-OFF SYSTEM

Charles W. Ray, 2827 Westbrook Dr., Buildings 3 & 4, Apt. 132, Fort Wayne, Ind. 46805

Filed May 29, 1979, Ser. No. 43,433
Int. Cl.[3] F16L *5/00, 55/14*
U.S. Cl. 137—368 8 Claims



1. The method of providing easily and quickly interruptible fluid flow to consumers by way of a buried pipe line distribution system comprising the steps of:

positioning a plurality of sunken access enclosures at selected locations in the distribution system to encompass a length of pipe at each location for providing access to the length of pipe at that location without the necessity of digging a hole at the location each time access to the length of pipe is required with the length of pipe located between upper and lower portions of the sunken access enclosure with sufficient clearance between the length of pipe and the enclosure to allow a tool to be moved vertically past the length of pipe and then generally horizontally into position spanning the pipe and with the enclosure including a restriction below the length of pipe; and

placing a removable shut off mechanism in the enclosure only when interruption in fluid flow is desired, the shut off mechanism including a C-shaped frame with an intermediate member slidably coupled to the frame for movement therealong and a threaded coupling between one end of the C-shaped member and the intermediate member for

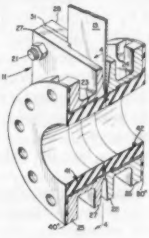
moving the intermediate member toward the one end of the C-shaped member, the step of placing including moving the shut off mechanism generally vertically past the length of pipe and then generally horizontally into position spanning the length of pipe with opposed facing gently curved jaw portions of the shut off mechanism spanning the pipe and aligning and engaging mating portions of generally flat parallel sides of the shut off mechanism and the enclosure restriction to prevent relative rotation between the enclosure and one part of the shut off mechanism.

4,257,447

GATE VALVE

Curtis W. Clarkson, Palo Alto, Calif., assignor to The Clarkson Company, Palo Alto, Calif.

Filed Jan. 29, 1979, Ser. No. 7,200
Int. Cl.[3] F16K *3/312, 3/316, 3/02*
U.S. Cl. 137—375 **18 Claims**



1. A packingless gate valve assembly comprising two body housing members having coaxial through passages, means securing said housing members together in end to end relation with means therebetween to define a relatively narrow transverse gate chamber, unitary annular sealing sleeve units lining each of said passages and extending the entire lengths of said passages whereby each sleeve has an inner end extending into said chamber and an outer end at a passage end remote from said chamber, each of said sleeve units extending into said chamber in the form of annular resilient lips adapted to sealingly engage each other under compression in the open position of said valve, and an imperforate gate slidable through said chamber between a valve open position where it does not block fluid flow through said passages and a valve closed position wherein it is interposed between said sealing lips.

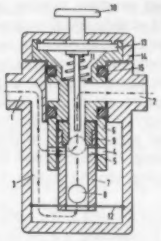
4,257,448

FLOW CUT-OFF DEVICE FOR INSERTION IN A GAS DUCT

Chan K. Shiu, and Leung W. Kwong, both of 8A, Hankow Rd., 5th Floor, Kowloon, Hong Kong

Filed Dec. 15, 1978, Ser. No. 969,837
Int. Cl.[3] F16K *17/00*
U.S. Cl. 137—460 **5 Claims**

1. A flow cut-off device for insertion in a gas duct, the device comprising an inlet and an outlet, a chamber on the inlet side of the device, a passage leading from the chamber to the outlet and including two mutually rotatable coaxial tubes having a plurality of holes through their walls arranged so that the flow cross-section through the passage can be altered by relative rotation of the tubes, and a seat on the outlet side of said holes; a blocking member subject on one side to the pressure in the chamber and on an opposite side to the pressure at the outlet; and means for guiding the blocking member between a lower non-blocking position and an upper position in which it engages the seat to block the passage and prevent gas flowing through the outlet, said blocking member being arranged to



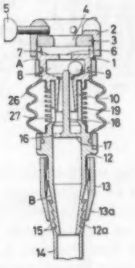
move to said upper position when the pressure differential across the blocking member exceeds a predetermined value.

4,257,449

HOSE COUPLING FOR A FAUCET

Tosio Takagi, 3-5, Shirogane 1-chome, Kokurakita-ku, Kitakyushu-shi, Fukuoka-ken, Japan

Filed Jun. 1, 1979, Ser. No. 44,463
Claims priority, application Japan, Jun. 10, 1978, 53-70220
Int. Cl.[3] F16K *31/12*
U.S. Cl. 137—505.25 **7 Claims**



1. A hose coupling for use with a faucet, said hose coupling comprising:

a main casing having a first threaded portion on the outer surface at the top thereof, said main casing having a cavity in the center thereof and there being an opening extending from the top portion of said casing through said cavity and to the bottom for defining a fluid passage therethrough;

valve means and valve seat means located in said cavity for closing off said opening;

a cap nut screwed on said threaded portion of said main casing, packing means interposed between said cap nut and said main casing, both said cap nut and said packing means having a hole in the center thereof for communicating with said opening through said main casing;

a hollow cylindrical extension connected to and extending downward from said cavity and communicating therewith through said valve seat;

a tubular lower body slidably received on said hollow cylindrical extension, said lower body having valve closing means for keeping said valve means open when fluid pressure in the hose is normal and closing when fluid pressure abnormally increases;

a first sleeve concentrically attached to said casing at the lower end thereof, said first sleeve having a flange extending therefrom;

spring means in contact with said lower body and with said flange for urging said casing and lower body together and

for having said valve closing means maintain said valve means open during normal fluid pressure conditions;

pressure sensing means connected to said casing and said lower body, said pressure sensing means comprising a bellows attached outside said first sleeve to said casing and and to said lower body, an opening in the side wall of said tubular lower body, said opening being in a portion of said lower body which extends within said bellows, for allowing fluid pressure to act on said bellows wherein, when fluid pressure increases abnormally, said bellows expands to overcome the spring force of said spring means for causing said casing and said lower body to separate for causing said valve closing means to close said valve means; and

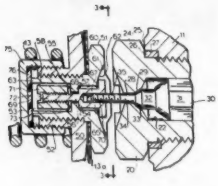
hose clamping means located at the lower end of said tubular lower body for connecting a hose thereto.

4,257,450

PRESSURE-REDUCING REGULATOR VALVE FOR HIGH-PRESSURE GASES

Louis A. Ollivier, Palo Alto, Calif., assignor to Veriflo Corporation, Richmond, Calif.

Filed Jun. 1, 1979, Ser. No. 44,521
Int. Cl.³ F16K *31/12*
U.S. Cl. 137—505.42 **10 Claims**



1. A pressure-reducing regulator for high-pressure gas, having a housing divided by a diaphragm assembly into a first chamber with a gas inlet and a gas outlet and a second chamber having a first spring for adjusting the pressure on said diaphragm assembly, said first chamber having a high-pressure portion connected directly to said gas inlet with a stationary valve seat coaxial with said diaphragm assembly and having an axial opening therethrough, and a movable valve coaxial with said diaphragm assembly and urged by a second spring toward said seat to close said axial opening and urged by said diaphragm away from said seat to admit gas from said high-pressure portion into a low-pressure portion of said first chamber connected to said gas outlet and having one end closed by said diaphragm assembly, the improvement of having in combination therewith:

an axial member loosely mounted to said diaphragm assembly along its axis by means providing limited lost axial motion with respect to said diaphragm assembly during operation of said regulator,

a nose portion of said valve extending through said axial opening through said seat and secured rigidly to said axial member, and

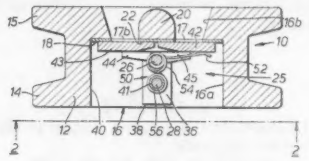
sealing means for preventing leakage through said diaphragm assembly around said axial member, so that upon movement of said diaphragm enlarging said first chamber, said second spring causes said movable valve and axial member to move with said diaphragm assembly and substantially close said movable valve against its seat, further movement of said diaphragm assembly eventually leading to pulling said movable valve more tightly against its seat and upon movement thereafter of said diaphragm to diminish said first chamber it at first does not cause movement of said movable valve and then upon exceeding the limit of the lost motion pushes said movable valve open against the pressure of said second spring.

4,257,451

CHECK VALVE

George Paton, Epping, Australia, assignor to Twinfold Nominees Pty. Limited, Northcote, Australia

Filed Aug. 16, 1979, Ser. No. 66,968
Claims priority, application Australia, Aug. 18, 1978, PD5577
Int. Cl.³ F16K *15/03*
U.S. Cl. 137—512.1 **8 Claims**



1. A check valve comprising;

a body with a passageway therethrough;

a valve seat defined by said body about said passageway;

a pin extending across the passageway;

a pair of valve members hingedly mounted to said pin for pivoting movement between respective open positions in the passageway and complementary closed positions in which the valve members together engage said valve seat to close off the passageway; and

torsional spring means to bias the valve members to their closed positions;

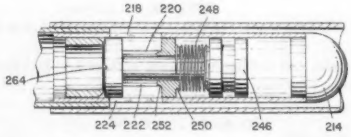
wherein the torsional spring means comprises a single length of wire formed into three windings which extend transversely within said passageway, two of which windings separately apply a biasing force to the respective valve members, while the third, being between the other two, is wound on an axis offset from the axes of the other two, the arrangement being such as to substantially prevent dissipation of stored compressive energy from either of said two windings to the other.

4,257,452

BIASED OPEN DIRECT RESPONSE VALVE WITH DAMPING MEANS

Donald C. Hill, Pasadena, and Robert W. Lyall, South El Monte, both of Calif., assignors to R. W. Lyall & Co., Inc., Santa Fe Springs, Calif.

Continuation of Ser. No. 600,856, Jul. 31, 1975, abandoned, which is a continuation-in-part of Ser. No. 535,185, Dec. 23, 1974. This application Jan. 25, 1979, Ser. No. 6,268
Int. Cl.³ F16K *21/10*
U.S. Cl. 137—514.7 **8 Claims**



1. An excess flow and pressure differential responsive safety valve for use in a fluid flow path, comprising in combination:

a generally elongated and hollow cylindrical body including openings therein for receiving fluid flow from said flow path into said body, said body having a closed upstream end and an open downstream end;

an annular valve seat means at said downstream end of said body, said seat means including an axial flow opening therein to permit fluid flow out of the downstream end of said body;

a valve cavity within said body upstream of said seat means;

actuating valve piston means in said valve cavity for axial movement therein and having an upstream and a downstream face and also having an open position in spaced relation to said seat means and a closed position in which the downstream face is in contact with said seat means, said piston means having its periphery, downstream face and at least a portion of its upstream face generally exposed to fluid flow from said openings, said openings being located in the wall of said body upstream of said seat means and opening into said valve cavity;

a divider wall in said body upstream of said openings and in downstream spaced relation to said closed upstream end to define a damping cavity separated from said valve cavity by said divider wall and which damping cavity is generally closed to fluid flow within said valve cavity;

rod guide receiving means in said divider wall for slidably receiving rod means for axial movement therein and for restricting radial movement thereof;

rod means attached to the upstream face of said piston means and extending generally axially rearwardly through said rod guide receiving means and into said damping cavity;

biasing means within said damping cavity operatively connected to said rod means for normally urging said piston means away from said seat to said open position when fluid flow in said valve body is within preselected velocity and pressure ranges;

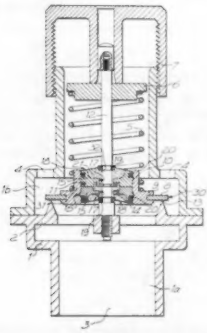
said piston means and rod means being designed to move axially in said body upon the occurrence of said preselected fluid flow pressures and velocities which overcome the force of said biasing means so that said piston means moves to said closed postion and engages said seat means; and said body includes damping means connected to said rod means for opposing actuating valve piston means movement in a degree variable with the velocity of valve piston means movement.

4,257,453

PEEP VALVE WITH IMPROVED VIBRATION DAMPING

Ole B. Kohnke, Lyngby, Denmark, assignor to Ruth L. Hesse, Rungsted Kyst, Denmark

Filed Apr. 6, 1979, Ser. No. 11,672
Int. Cl.[3] F16K *15/02, 47/00*
U.S. Cl. 137—514.3 **5 Claims**



1. In an expiration valve including: a valve housing presenting an inlet arranged to be connected to the expiratory outlet of ventilating apparatus, and an outlet; means defining a valve seat disposed within the housing between its inlet and outlet; a valve disc arranged to cooperate in a sealing manner with the valve seat: a compression spring acting against the side of the valve disc which is remote from the valve seat for biasing the valve disc into its sealing position against the valve seat in the direction counter to the air flow direction between the inlet and the outlet; and means defining a damping chamber disposed within the valve disc and containing a viscous fluid, for causing movement of the viscous fluid within the chamber to damp vibrations of the disc during movement of the disc within said housing, the improvement wherein:

said valve disc is provided with a through bore;

said valve further comprises a valve rod secured within said housing and extending through said valve disc bore between the opposite sides of said valve disc;

said means defining a damping chamber comprises a pair of flexible, annular diaphragms each extending between said valve rod and said valve disc, and spaced apart along the length of said rod to delimit opposite ends of said damping chamber;

said valve further comprises a rigid disc disposed within said damping chamber and fixed to said valve rod; and

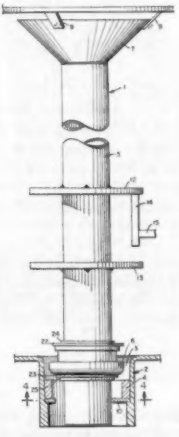
said valve disc is provided with portions extending radially inwardly toward the interior of its bore to define abutment surfaces for said rigid disc in order to limit the axial movement of said valve disc relative to said valve rod.

4,257,454

DRAIN PLUGS

Erik O. Vilen, La Grange Park, Ill., assignor to G. S. Blakeslee & Company, Chicago, Ill.

Filed Dec. 4, 1978, Ser. No. 966,073
Int. Cl.[3] E03B *9/00;* **F17D** *1/13*
U.S. Cl. 137—593 **10 Claims**



1. A drain plug for use with a device embodying a compartment for holding a supply of liquid, with the compartment having a drain opening in the bottom thereof, and with an annular valve seat disposed in said opening, and an annular guide means disposed in said opening below said annular valve seat, said drain plug comprising

a. an elongated, open standpipe

(1) adapted to be reciprocated downwardly and upwardly through such a valve seat into and out of such a drain,

(2) having a substantially radially outwardly projecting member thereon, and

(3) wherein said upper end provides drain cup means for said standpipe, and

b. an annular, resilient member

(1) mounted on said standpipe adjacent the end opposite said upper end

(a) in surrounding relation thereto, and

(b) below said outwardly projecting member, on said standpipe,

(2) having a bottom lower face, and

(3) disposed in such position on said standpipe that during said downward movement of said standpipe through

said valve seat said end opposite said upper end is engageable with said annular guide means to align said standpipe in a vertical position and wherein said outwardly projecting member is effective to compress said resilient member against said valve seat with said lower face of said resilient member in abutting engagement with said valve seat,

c. said resilient member comprising

(1) a lower end portion defining said bottom lower face,

(2) an upper end portion

(a) spaced outwardly from said standpipe a greater distance than said lower end portion, and

(b) having a radial thickness which is less than the radial thickness of said lower end portion.

4,257,455

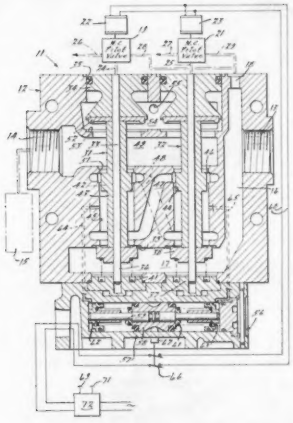
DOUBLE SAFETY VALVE FOR STAMPING PRESSES AND THE LIKE

Russell J. Cameron, Rochester, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.

Continuation-in-part of Ser. No. 73,000, Sep. 6, 1979, abandoned. This application Jan. 31, 1980, Ser. No. 117,119

Int. Cl.³ F15B *13/043, 20/00*

U.S. Cl. 137—596.16 **16 Claims**



1. In a double safety valve, a housing, a pair of valve stems in said housing, pistons slidable in housing cylinders at one end of said valve stems, extensions at the other ends of said valve stems slidable in bearings in said housing, whereby the valve stems are radially supported at their opposite ends by said cylinders and bearings, an inlet chamber, poppet valves carried by said valve stems in said inlet chamber, spool valves on intermediate portions of said valve stems, crossover passages leading from the poppet valve of each valve stem to the spool valve of the other valve stem, an outlet chamber connected to said spool valves, an exhaust port in said housing, and a pair of exhaust valves on said valve stems between said outlet chamber and said exhaust port.

4,257,456

PRESSURE COMPENSATED SPOOL VALVE

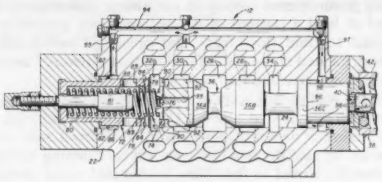
Thomas L. Elliston, Ft. Worth, Tex., assignor to Hydra-Rig, Inc., Fort Worth, Tex.

Filed Oct. 29, 1979, Ser. No. 88,774

Int. Cl.³ F15B *13/04*

U.S. Cl. 137—613 **11 Claims**

1. In a hydraulic spool valve of the type including a housing having a bore, a delivery port and an exhaust port communicating with the bore, and a spool received in slidable sealing engagement with the housing bore and reciprocably movable through the bore between a first position blocking the delivery port and a second position opening the delivery port for discharge through the bore into the exhaust port, the improvement comprising;



a floating piston movably coupled in releasable engagement with said spool, the engagement of said piston with said spool defining a restricted flow path for limiting hydraulic flow from said delivery port to the exhaust port as said spool moves from the blocking position toward the open position.

4,257,457

DISCHARGE VALVE APPARATUS OF COMPRESSOR

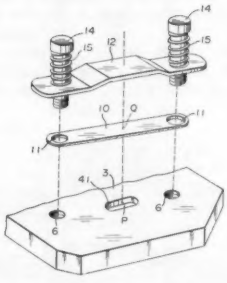
Koji Namura, and Akemi Futakawa, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1978, Ser. No. 946,328

Claims priority, application Japan, Sep. 29, 1977, 52/131802[U]

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—851 **3 Claims**



1. In a discharge valve apparatus of a compressor comprising a valve plate having a single discharge port;

a long thin discharge valve covering said discharge port;

a valve stopper overlaying on said long thin discharge valve and holding means for holding said long thin discharge valve on said valve plate at a specific position so as to be capable of bending said long thin discharge valve depending upon the actuation of said compressor;

wherein said discharge port is formed in an elliptic shape on the surface of said valve plate, whereby the compressive stress on said valve adjacent said discharge port is decreased.

4,257,458

REED VALVE

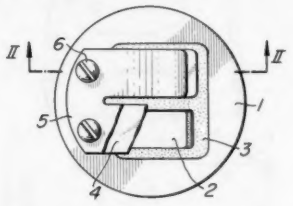
Takashi Kondo, Oobu; Yasuo Tagawa, Kariya; Kiyohiko Mizuno, Nagoya, and Nobutoshi Tsuboi, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Filed Mar. 14, 1978, Ser. No. 886,593

Claims priority, application Japan, Mar. 16, 1977, 52-31615

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—855 **7 Claims**



1. In a reed valve comprising a base formed with at least one aperture through which a fluid flows, a shock absorbing seat attached to the upper surface of said base and having at least one aperture in registered relation with said aperture of said base and a reed made of a resilient sheet material and securely fixed at its one end to said base so as to extend over said aperture of said seat for opening and closing said aperture in response to the pressure variations applied to the upper surface thereof, an improvement in which at least a portion of the inner peripheral wall of said seat defining said seat aperture under the free end portion of said reed is displaced outwardly from the corresponding portion of the inner peripheral wall of said base defining said base aperture; the upper edge of said inner peripheral wall of said seat being beveled; said base being formed on the upper surface thereof with a recess surrounding said base aperture and having a depth equivalent to the thickness of said seat for tightly fitting said seat thereinto; said inner peripheral wall of said base aperture and a portion of the bottom wall of said recess uncovered with said seat being covered with a thin layer formed integral with said seat and the upper edge of said inner peripheral wall of said base aperture and the inner corner of said thin layer covering said upper edge of said base aperture being beveled.

4,257,459

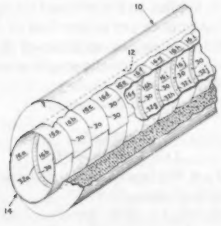
METHODS OF AND APPARATUS FOR LINING THE INTERNAL WALLS OF A CONDUIT FOR CONVEYING FLUID CARRYING MARINE FOULING ORGANISMS WITH A LINER OF ANTI-FOULING MATERIAL

Richard H. Jenks, Sauquoit, N.Y., assignor to Revere Copper and Brass Incorporated, New York, N.Y.

Filed Feb. 23, 1979, Ser. No. 14,486

Int. Cl.³ F16L *9/14*

U.S. Cl. 138—147 **8 Claims**



1. In a conduit for conveying fluid carrying marine fouling organisms and wherein said marine organisms adhere to or collect on the internal walls of said conduit thereby constricting the flow of said fluid through said conduit,

WHEREIN THE IMPROVEMENT COMPRISES:

radially outwardly expandable liner means residing within said conduit and for preventing said marine fouling organisms from contacting and thereby from adhering to or collecting on said internal walls of said conduit;

said liner means of a predetermined anti-fouling material to which said marine fouling organisms do not substantially adhere or collect upon contact therewith; and

expansion means residing within said liner means and for expanding said liner means radially outwardly into tight engagement with said internal walls of said conduit with sufficient force to prevent movement of said liner means with respect to said conduit upon said fluid flowing through said conduit.

4,257,460

WATER GUN

Bruce J. Paranay, 10401 Encino Ave., Granada Hills, Calif. 91344, and Melvin D. Michael, 4312 1/2 Whitsett Ave., Studio City, Calif. 91604

Filed Jun. 12, 1979, Ser. No. 47,879

Int. Cl.³ B65B *3/16*

U.S. Cl. 141—26 **8 Claims**

1. A water gun device comprising:

an elongated body having a central bore extending therethrough opening at one end in a nozzle and opening at its opposite end in an attachment end of said body:

an expandable bladder having an opening for receiving a pressurized fluid releasably carried on said attachment end of said elongated body in fluid communication with said central bore;

means for detachably coupling said expandable bladder to said attachment end of said elongated body; and

said nozzle being tapered from the exterior diameter of said body towards said central bore opening associated therewith;

said attachment end of said elongated body includes an annular bead over which said bladder is stretched in gripping relationship;

said coupling means is a clamp adapted to encircle said bladder gripping said attachment end.

4,257,461

DEVICE FOR FEEDING TREES IN TREE DELIMBING MACHINES

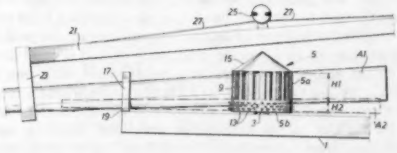
Percy Wangeby, Norrala, and Nils-Erik Pahlsson, Malmö, both of Sweden, assignors to Kockums Industri AB, Fack, Sweden

Filed Apr. 4, 1979, Ser. No. 26,880

Claims priority, application Sweden, Apr. 10, 1978, 7804011

Int. Cl.³ B27L *1/00*

U.S. Cl. 144—2 Z **8 Claims**



1. A delimbing machine comprising a frame, means on said frame for delimbing a tree trunk feed rolls with drive means for

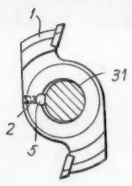
feeding a tree trunk through the delimbing means said feed rolls being mounted on said frame and being movable in a direction towards and away from the tree trunk and a beam having gripping means for gripping the tree trunks and inserting them between said feed rolls, said delimbing machine being provided with means for automatically controlling the drive means for the displacement of the beam in its longitudinal direction in relation to the drive means for the feed rolls in such a manner that the feed rolls as well as the beam contribute simultaneously to provide the total force required for feeding the tree trunk through the machine.

4,257,462

TOOL FASTENING SYSTEM FOR WOODWORKING MACHINES OR THE LIKE

Jaime M. Oller, Victor Pradera 43, Tarrasa, Barcelona, Spain

Continuation of Ser. No. 913,939, Jun. 8, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 114,007
Claims priority, application Spain, Jun. 8, 1977, 459.618
Int. Cl.[3] **B27G** *13/00;* **B26D** *1/12;* **B23B** *5/22*
U.S. Cl. 144—218 **6 Claims**



1. A tool fastening system for woodworking machines or the like wherein a tool or toolholder is removably secured on a driven shaft for conjoint rotation comprising radially directed fastening means in said tool or toolholder having a contact end adapted for gripping engagement with said shaft, said fastening means being radially movable into and out of such gripping engagement, and comprising a threaded fastener and an intermediate member acting between said threaded fastener and said driven shaft, said shaft being round, said intermediate member having a cross-section similar to a half-moon and including the area between a first and second intersecting circle, said first circle having the same radius as said shaft, thereby providing for said engagement, said second circle having a lesser radius, said tool or toolholder having a recess of substantially the same radius as said second circle and retaining said intermediate member therein.

4,257,463

COMBINATION CARRYING CASES

Rosemarie Monaco, 59-30 108th St., Corona, N.Y. 11368

Filed Jun. 21, 1979, Ser. No. 50,292
Int. Cl.[3] **A45C** *3/02*
U.S. Cl. 150—35 **10 Claims**

1. A combination attache case comprising: (a) a shoulder strap having opposite ends and releasable first coupling means at each of said ends, (b) an attache case comprising an upper part, a front wall including an outer front surface thereof with a pocket therein, a rear wall, handle means extending from said upper part, and a first pair of second coupling means located on said upper part of said attache case, each of said second coupling means adapted for releasable engagement with one of said first coupling means, and (c) a handbag comprising a front panel, a rear panel including an outer rear surface thereof and a third coupling means extendable from said handbag, said combination further comprising fourth coupling means located on said front surface of said attache case and adapted for releasable engagement with said third coupling means, fifth coupling means situated on said rear panel of said handbag, and second pair of said second coupling means also situated on said handbag, whereby said first coupling means on said shoulder strap is releasably engagable selectively to said first or said second pair of second coupling means for converting said attache case or said handbag into a shoulder attache case or a shoulderbag respectively, and said handbag is insertable into said pocket of

said attache case at which time said third coupling means is releasably engagable to said fourth coupling means for securing said handbag in said pocket, and said third coupling means is also releasably engagable to said fifth coupling means when said handbag is removed from said pocket.

4,257,464

PROTECTIVE GUN COVER

Robert L. Binney, 15 Knottingham Ct., Stockbridge, Ga. 30281

Filed Jul. 23, 1979, Ser. No. 59,675
Int. Cl.[3] **F41C** *27/00;* **B65D** *81/26, 85/00*
U.S. Cl. 150—52 R **3 Claims**

1. A gun cover formed of a flexible free breathing textile fabric having an interior pile surface for contact with a gun placed in the cover, and the pile surface having applied thereto a lubricating rust and corrosion inhibiting material which is long lasting said free breathing fabric providing for the ready passage of air therethrough to lessen any condensation or moisture on or around an enclosed gun, said textile fabric being formed of acrylic polyester and said pile surface being a shearling pile surface, said lubricating material being applied to the pile surface in spray form and comprising a petroleum distillate composition that is applied to the pile surface approximately in the amount of ¼ fluid ounce per square foot of the pile surface, and said composition being a mixture of TRI-FLON and WD-40 in the approximate ratio of one ounce of TRI-FLON to four ounces of WD-40.

4,257,465

LOCK WASHER

Dennis G. Berg, East Rockaway, N.Y., assignor to Winfred M. Berg, Inc., East Rockaway, N.Y.

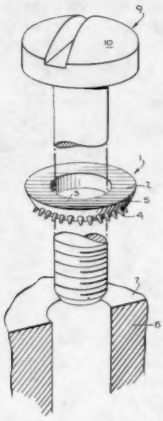
Filed Apr. 12, 1979, Ser. No. 29,315
Int. Cl.[3] **F16B** *39/24*
U.S. Cl. 411—147 **10 Claims**

1. A unitary molded lock washer for securing threadedly connected elements comprising:

a washer body having opposite faces for engaging the coupled elements;

one of said opposite faces being planar and the other having an inner planar portion whose outer edge portion curves towards the outer edge of said other face;

an aperture in said washer body;



a plurality of integral projections on said washer positioned around said aperture; and

said projections extending outwardly of the body from the curving portion of said other washer body face and having their free ends projecting beyond the plane of said other face.

4,257,466

DEVICE FOR CAPTIVELY RETAINING A THREADED MEMBER

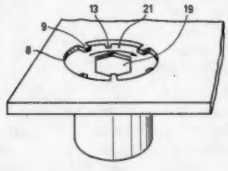
Kurt Eisemann, Berlin, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,410

Claims priority, application Fed. Rep. of Germany, May 3, 1978, 2819336

Int. Cl.[3] **F16B** *37/04*

U.S. Cl. 411—371 **2 Claims**



1. A threaded member retaining device, comprising

a plastic part having a recess;

a threaded member loosely accommodated in the recess, and

a retaining ring located in the recess for capturing the threaded member,

wherein the recess has a ring-positioning-rim, and a wall having a plurality of radially inward projecting ridges extending longitudinally from the rim, and

the retaining ring has a corresponding plurality of peripheral indentations arranged to provided clearance from said ridges when the ring is in an insertion position for longitudinal movement of the ring into or out of the recess, and means for engagement by a tool to rotate the ring, in a retaining position the ring being rotated from said insertion position such that the periphery of the ring between said indentations cuts through said ridges, whereby in the retaining position the ring is secured against longitudinal movement or unintended rotation to the insertion position, but the ring may non-destructably be rotated from the retaining position to the insertion position for removal.

4,257,467

RUN-FLAT TIRE

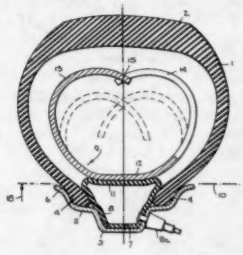
Sjirk Van der Burg, Embourg, Belgium, assignor to Uniroyal AG, Aachen, Fed. Rep. of Germany

Continuation of Ser. No. 831,829, Sep. 9, 1977, Pat. No. 4,177,848. This application Jul. 16, 1979, Ser. No. 57,775

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653658

Int. Cl.[3] **B60C** *17/04*

U.S. Cl. 152—158 **5 Claims**



1. In a pneumatic, tired wheel having a tubeless inflatable tire mounted on the rim of the wheel and having an inner tire surface, the improvement comprising a toroidal support device to enable the tired wheel to travel in a flat state, said support device comprising:

an inflatable, toroidal inner tube located in a well of the rim and having sidewall portions directly engageable with the tire beads to elastically clamp the tire beads against the rim flanges, said tube radially extending outwardly from the well of the rim to or slightly beyond the radially outer edges of the rim flanges, the radially outward portion of said tube having a radially external outer circumferential area, said tube being inflatable independently of the tire; and

a separate noninflatable toroidal support element having a discrete cross-sectional shape within and without said tire, and sidewall portions that are discontinuous with corresponding sidewall portions of said inner tube, said support element being mounted on the radially extending outer circumferential area of said inner tube and being normally free from contact with said tire beads when the tire is in an inflated state, said support element having a radially internal circumferential wall section impervious to puncture, lying adjacent the radially external circumferential area of the inner tube and having an outer surface area spaced from the inner surface area of the tire when the tire is in its inflated state so that under normal travel conditions the support element does not contact the inner surface area of the tire.

4,257,468

PNEUMATIC TIRE HAVING AN IMPROVED CHIPPING RESISTANT PROPERTY EMPLOYING SYNDIOTACTIC-1,2-POLYBUTADIENE IN TREAD RUBBER

Masaki Ogawa, Sayama; Tamio Araki, Musashino, and Shinji Yamamoto, Ichihara, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, and Ube Industries Limited, Ube, both of Japan

Filed Apr. 5, 1979, Ser. No. 27,413
Claims priority, application Japan, Apr. 6, 1978, 53-39678
Int. Cl.³ B60C *11/00, 1/00;* **C08L** *7/00*
U.S. Cl. 152—209 R **5 Claims**

1. A pneumatic tire having an improved chipping resistant property, comprising a tread portion formed from a vulcanizate of a rubber composition comprising; (a) 3–40 parts by weight of preformed short fibers of syndiotactic-1,2-polybutadiene having a maximum diameter of not more than 10μ and an average diameter of less than 1μ, (b) 30–100 parts by weight of carbon black having an iodine adsorption value of not less than 76 mg/g and (c) 0.2–5 parts by weight of a p-phenylenediamine type antioxidant, on a basis of 100 parts by weight of (d) a rubber selected from natural rubbers, synthetic rubbers and blends thereof in an optional blending ratio.

4,257,469

RADIAL TIRE HAVING INNER AND OUTER CARCASS LAYERS, CORDS OF OUTER LAYER ARE THINNER RELATIVE TO INNER AND COVER BEAD FILLER

Yukihisa Uemura, Nara, Japan, assignor to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Aug. 17, 1978, Ser. No. 934,513
Claims priority, application Japan, Aug. 17, 1977, 52-99039
Int. Cl.³ B60C *9/08, 15/00*
U.S. Cl. 152—356 R **5 Claims**

1. A radial tire for heavy duty vehicles with a plurality of carcass ply layers comprising inner and outer ply layers made of textile cords whose end portion turn around a bead core and return along a bead filler, wherein:

one or more inner layers comprise cords,

one or more outer ply layers comprise cords thinner than said cords of said inner ply layers, and

at least an outermost ply layer of said outer ply layers has such turnup as to be long enough to cover said bead filler.

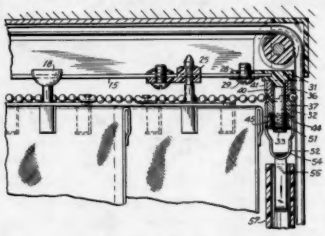
4,257,470

WAND CONSTRUCTION FOR VERTICAL VENETIAN BLINDS

Allan S. Woodle, Mamaroneck, N.Y., assignor to Thru-Vu Vertical Blind Corp., Namaroneck, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,320
Int. Cl.³ E06B *9/30, 9/26*
U.S. Cl. 160—172 **4 Claims**

1. In a vertical type Venetian blind, including a header element forming a track supporting a plurality of depending vane elements for lateral translational movement within said track, and rotational movement about the principal axes of said vane elements, said vane elements being interconnected by a single ball chain at each of two spaced points on each vein element, improved means for communicating manually imparted movement by a user to said ball chain for rotating said vane elements, said means comprising: a vertically depending shaft supported by said header element, a pair of generally cylindrical pulley members rotatably positioned upon said shaft, each pulley member having a surface defining recesses corresponding to the shape of said ball chain, whereby when said surfaces are placed in juxtaposed relation, a single shaped curvilinear channel accommodating said chain is formed; resilient means carried by said shaft for urging said surfaces to said



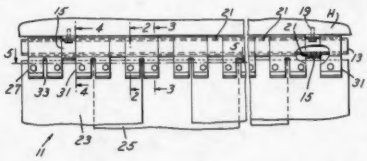
juxtaposed relation; a generally U-shaped clip having means thereon engaging said one of said pulley members, and a manually engageable elongated wand having means at an upper end thereof; pivotally engaging said clip means to form a flexible joint for the transmission of rotational motion therethrough; said one of said pulley members being axially shiftable along said shaft against said resilient means to permit slippage of said one of said pulley members relative to an entrained segment of said chain upon the occurrence of excessive transmitted torque to prevent damage to said blind.

4,257,471

STRIP CURTAIN DOOR

Elmer T. Thurmond, Jr., Miami, Fla., assignor to Equipment Company of America, Hialeah, Fla.

Filed Nov. 1, 1978, Ser. No. 956,542
Int. Cl.³ A47H *1/00*
U.S. Cl. 160—332 **10 Claims**



1. In a strip curtain door adapted for positioning across a door opening having a header, an elongated curtain rod spanning the door opening at the top thereof, spaced hanger brackets supporting said rod and secured to said header, a series of upright elongated flat flexible strips of plastic material with their adjacent edges overlapped to form a double thickness of plastic strip material, with the strips being of uniform thickness throughout and extending across said opening over the height thereof pivotally suspended at their upper ends from said rod; the improvement which comprises:

a series of clips loosely, pivotally and flexibly mounted on said rod and spaced longitudinally apart along the length of said rod;

said clips each having a pair of opposed semicircular symmetrical bodies mounted on said rod, each body having two downwardly extending fingers which are spaced longitudinally apart below said rod and which converge toward the opposite fingers of the opposed body of the clip, each clip being slotted defining a pair of said fingers

therein with the opposite fingers on a pair of opposed bodies being laterally spaced apart to receive therebetween either a single thickness or a double thickness of plastic strip material;

a fastener carried by each finger of one body of each clip and extending either through an opening provided in a single thickness or in a double thickness of plastic strip material and thereafter extending through an opening provided in the opposite finger of the other opposed body of the clip;

the inner surfaces of said opposite fingers on the opposed bodies below the corresponding fastener forming clamping surfaces;

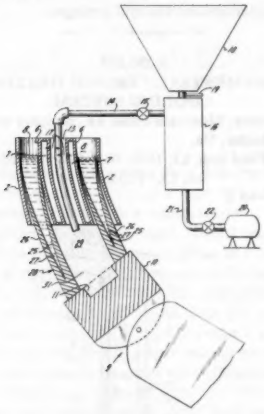
each of the openings in the plastic strip material being larger than the diameter of the corresponding fastener to provide clearance between the fastener and the plastic strip material to insure that when the clamping surfaces of each pair of opposite fingers are urged together upon tightening of the corresponding fastener, the single thickness or the double thickness of plastic strip material therebetween, is frictionally held, supported and clamped solely by said opposite fingers on said opposed bodies of the clamp and is not carried by the fastener, whereby the fasteners also constitute the sole means for holding said clamps on said rod.

4,257,472

CONTINUOUS CASTING OF HOLLOW SHAPES

Heinrich Tanner, Herisau, Switzerland, assignor to Concast Incorporated, Montvale, N.J.

Filed Jul. 30, 1979, Ser. No. 62,084
Int. Cl.³ B22D *11/124, 11/128*
U.S. Cl. 164—70 **13 Claims**



1. A method of continuously casting hollow shapes comprising the steps of:

(a) continuously admitting molten metal into an open-ended casting space circumferentially bounded by inner and outer surfaces;

(b) cooling said surfaces to form a body having solidified inner and outer skins which confine a mass of said molten metal;

(c) withdrawing said body from said casting space to generate a continuous, partially solidified strand having a hollow interior;

(d) conveying a finely divided solid into said hollow interior to form a core which supports said inner skin and withdraws heat therefrom by undergoing an endothermic transformation within said hollow interior; and

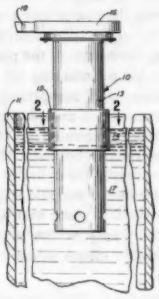
(e) removing said core after said strand has solidified.

4,257,473

CONTINUOUS CASTING SHROUD APPARATUS AND METHOD

Norman T. Mills, Highland, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Oct. 2, 1978, Ser. No. 947,652
Int. Cl.³ B22D *11/10*
U.S. Cl. 164—82 **12 Claims**



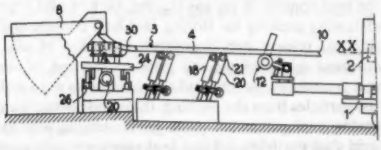
1. A method of continuous casting steel including introducing molten steel from a supply source through a tubular feed nozzle which is formed of a refractory oxide material into a continuous casting mold having a pool of molten steel and a layer of molten slag which has a high solubility for said refractory oxide material maintained on the surface of the molten steel in the upper end of the mold which comprises; conducting molten steel from a supply source through a tubular feed nozzle formed of said refractory oxide material into a continuous casting mold with the lower end of said feed nozzle submerged below the surface of the pool of molten steel in the mold, and maintaining the outer surface of said feed nozzle which is normally in contact with said layer of molten slag during continuous casting enclosed within a protective tubular member having at least the outer surface formed of refractory material containing at least 50 percent by volume refractory material selected from the group consisting of silicon nitride, boron nitride and zirconium diboride with said selected refractory material bonded by the selected one of said groups of refractory material to form said tubular member.

4,257,474

ADJUSTABLE SUPPORT FOR THE METAL SUPPLY UNIT FOR A MACHINE FOR CENTRIFUGALLY CASTING PIPES

Pierre H. M. Fort, Nancy, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Jan. 9, 1979, Ser. No. 2,138
Claims priority, application France, Jan. 27, 1978, 78 02278
Int. Cl.³ B22D *13/10*
U.S. Cl. 164—299 **2 Claims**



1. In a support structure in combination with a unit which supplies iron to a machine for centrifugally casting tubular bodies and comprises a pouring ladle, two laterally spaced

apart pouring channels having pouring spouts at their upstream ends and a common carriage which is movable in translation in a direction perpendicular to said channels and carries the pouring spouts, said carriage moving in said direction between two positions permitting the pouring spouts to be brought alternately in position under the ladle for conveying metal from the ladle into a mould of the casting machine while the other pouring spout is laterally offset from the ladle; the improvement wherein the support structure comprises a platform rigidly supporting the two pouring spouts, a single device which is adjustable in height and connects the platform to the carriage for adjusting the height of the platform relative to the carriage, and means for maintaining the platform horizontal and damping vibrations and comprising guide pillar means fixed on the carriage and rigid cylinder means rigidly fixed to the platform and slidably mounted on the pillar means, and releasable means interposed between the pillar means and cylinder means for rendering the cylinder means rigid with the pillar means, said pillar means and said single adjustable device being contained in a vertical plane mid-way between the two pouring spouts whereby easy access is had to the adjustable device and the releasable means when each channel is positioned under the ladle.

4,257,475

RECOVERY OF THE HEAT CONTENT OF CORROSIVE AND DUST-CONTAINING GASES

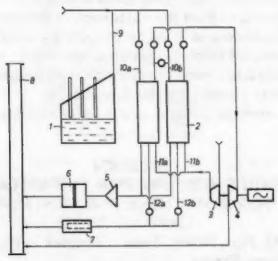
Fritz Jakob, Achmüle, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,640

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809358

Int. Cl.³ F28D *17/00*; F28G *5/00*

U.S. Cl. 165—1 **21 Claims**



1. A process for recovering the heat content of hot waste gas containing dust particles comprising the steps of (a) in a heat release step, passing the hot waste gas into one of at least two interchangeable and cyclically connected regenerators to release the heat content of the gas therein, each of said regenerators containing packing for storing said heat content and during said heat release step depositing a portion of said dust particles onto said packing and prior to the end of step (a) passing a pressure surge into said regenerator so as to dislodge said dust particles from the packing; (b) withdrawing from said regenerator resultant cooled waste gas containing substantially all of said dust particles; (c) in a heat recovery step, passing a heat recovery gas into said regenerator to recover the heat stored in the packing thereof, said heat recovery gas absorbing substantially no dust particles deposited in step (a); and (d) withdrawing resultant heated substantially dust-free heat recovery gas from step (c) from the regenerator.

4,257,476

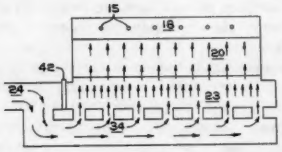
MANIFOLD REGENERATION FLUES FOR REGENERATIVE FURNACES

Yih-Wan Tsai, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1979, Ser. No. 25,139

Int. Cl.³ F28D *17/04*

U.S. Cl. 165—9.3 **7 Claims**



1. In a regenerative furnace of the type comprising a combustion chamber, a pair of regenerator chambers, a plurality of burner ports spaced along the sides of the combustion chamber providing for alternate passage of air and exhaust gases between the combustion chamber and the regenerator chambers; each regenerator chamber including an internally unpartitioned, gas pervious bed of refractory material in communication along one side with the ports, and an elongated, unitary gas distributing space in communication with substantially the entire opposite side of the gas pervious bed; the improvement comprising: a manifold flue in communication with the gas distributing space by way of a plurality of passages spaced apart along the length of the gas distributing space, including a passage near each end of the gas distributing space and at least one passage intermediate the end passages

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4,257,477

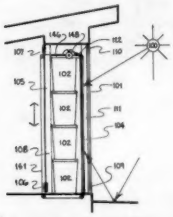
ENVIRONMENTALLY DRIVEN HEATING AND COOLING SYSTEM

Timothy Maloney, Mountain Falls, Va., assignor to One Design, Inc., Winchester, Va.

Filed Sep. 12, 1978, Ser. No. 941,735

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—48 S **39 Claims**



1. In an environmentally driven heating and cooling system, which includes:

wall means defining at least two containers each for a quantum of thermal storage mass, each including surface means for collecting and radiating heat;

each said container in a use condition having a filling of said quantum of thermal storage mass;

a building structure for a situs, and including a glazed portion sited for sunlight to fall along a path directly or indirectly thereon;

said containers being deployed in a group in said building structure when in said use condition, behind said glazed portion, relative to the path of sunlight falling on said glazed portion;

the improvement wherein:

the at least two containers further have a shipping condition wherein the at least two containers lack said filling and are more condensed relative to one another than when grouped, so that while being shipped to said situs in said shipping condition, said at least two containers occupy less space than when grouped and in said use condition;

each container being formed of sheet material having two sidewall panels integrally joined to a bottom panel along two corresponding end panels;

a plurality of heat radiating fin means each having a joining flange and a fin portion;

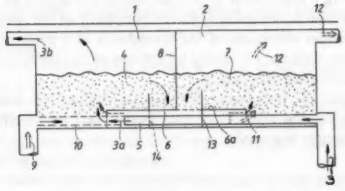
each joining flange being secured to one of a sidewall and a bottom of a said container and lying generally flatwise against the respective sidewall or bottom while that container is in said shipping condition thereof, and said respective fin portion being bendable outwards during field erection of said wall means to constitute a respective useful fin for heat radiation.

4,257,478

GASEOUS MEDIA HEAT EXCHANGER

Gunnar Stendahl, Linköping, Sweden, assignor to Stal-Laval Apparat AB, Sweden

Filed Jun. 27, 1979, Ser. No. 52,469
Int. Cl.³ F28D *13/00*
U.S. Cl. 165—104 F **3 Claims**



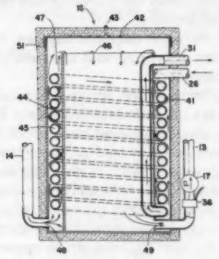
1. A heat exchanger for transmitting heat between gaseous media, comprising, means defining at least two adjacent chambers each partially filled with a solid transmitting medium in the form of pellets, granules or sand, at least one first conduit for the injection of a first gaseous medium of a predetermined temperature into a first of said chambers at the bottom thereof, at least one second conduit for the injection of a second gaseous medium of a temperature higher than said predetermined temperature into a second of said chambers at the bottom thereof, means on said first chamber associated with said second conduit and opening into said second chamber, means on said second chamber associated with said first conduit and opening into said first chamber, both said opening means thereby establishing communication between said chambers, said first and second gaseous media being injected at a rate for effecting fluidized beds of said transmitting medium in said chambers, the outlet end of said first conduit lying inwardly adjacent the terminal end of said second chamber means which opens into said first chamber for producing an ejector effect of said first gaseous medium into said first chamber, and the outlet end of said second conduit lying inwardly adjacent the terminal end of said first chamber means which opens into said second chamber for producing an ejector effect of said second gaseous medium into said second chamber, whereby said transmitting medium is transported from said first to said second chamber and from said second to said first chamber, respectively, by the ejector effects of said first and second gaseous media to thereby effect an increase in temperature of said first medium and a decrease in temperature of said second medium while passing through said transmitting media.

4,257,479

HEAT EXCHANGER AND DRAIN DOWN FOR SOLAR COLLECTOR

T. Lawrence Newton, Atherton, Calif., assignor to Sunburst Solar Energy Corp., Menlo Park, Calif.

Filed Apr. 2, 1979, Ser. No. 26,316
Int. Cl.³ F28D *7/12*; F24J *3/02*
U.S. Cl. 165—156 **7 Claims**



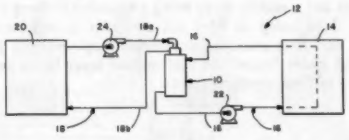
1. A heat exchanger and drain down comprising a casing, a tank within said casing and of lesser cross-section than said casing so that a gap exists between said tank and said casing, said tank having an opening at its top communicating with said gap, a first port at the bottom of said casing communicating with said gap, a second port at the bottom of said tank, and heat exchange means for circulating a first liquid for thermal exchange with a second liquid circulating from said first port upward through said gap, through said opening into said tank and out said second port, said heat exchange means being located in said gap, said heat exchange means comprising a helical coil of tubing, said first port, said gap, said tank and said second port comprising a normally closed second liquid system isolated from said first liquid.

4,257,480

HEAT EXCHANGER AND METHOD

Robert K. Winkleblack, San Jose, Calif., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Aug. 28, 1978, Ser. No. 937,275
Int. Cl.³ F28D *7/10*
U.S. Cl. 165—165 **10 Claims**



1. A heat exchanger for transferring heat from primary fluid to secondary fluid, comprising:

(a) support means for supporting a group of vertically extending, thermally conductive concentric shells spaced-apart from one another fixed distances for defining therebetween

(i) a plurality of vertically extending open ended primary annuli, the top ends of which define inlets into the annuli and the bottom ends of which define outlets out of the annuli, and

(ii) a plurality of vertically extending secondary annuli respectively disposed between said primary annuli;

(b) means for sealing closed the top and bottom ends of said secondary annuli for physically isolating said secondary annuli from said primary annuli;

(c) primary fluid inlet means cooperating with said support means and adapted to receive a supply of primary fluid

heated by a given source of heat and in fluid communication with the top opened inlets of said primary annuli for directing said heated primary fluid into the latter;

(d) primary liquid outlet means cooperating with said support means and in fluid communication with the bottom opened outlets of said primary annuli for directing said primary fluid from said primary annuli back to said source of heat;

(e) a secondary fluid inlet disposed within the innermost one of said concentric shells for receiving said secondary fluid from an external location;

(f) a secondary fluid outlet disposed adjacent to the secondary fluid inlet for delivering said secondary fluid back to said external location;

(g) means for defining a first group of radially extending inlet passageways between said secondary fluid inlet and said secondary annuli, adjacent one end of the latter and through but isolated from said primary annuli, said first group of passageways serving to pass said secondary fluid from said secondary inlet into said secondary annuli; and

(h) means for defining a second group of radially extending outlet passageways between said secondary annuli and said secondary fluid outlet, adjacent an opposite end of the secondary annuli and through but isolated from said primary annuli, said second group of passageways serving to pass said secondary fluid from said secondary annuli into said secondary outlet.

4,257,481

CEMENT PANEL HEAT EXCHANGERS

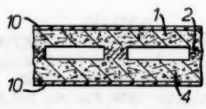
Michael J. Dobson, Barnhouse, Kemerton, Tewkesbury, Gloucestershire, England

Filed Jun. 3, 1976, Ser. No. 692,507

Claims priority, application United Kingdom, Jun. 5, 1975, 24239/75; Oct. 4, 1975, 40717/75

Int. Cl.[3] **F28F** *3/12, 21/04;* **F24J** *3/02*

U.S. Cl. 165—168 **4 Claims**



1. A solar heating panel constructed principally in layers of cement mixes, upper and lower layers having glass fiber reinforcement and a middle layer being channeled to form a liquid conduit, there being an inlet and an outlet to and from said conduit, said fiber reinforcement being disposed only in said upper and lower layers and said middle layer being substantially free of fiber reinforcement

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4,257,482

SONIC GRAVEL PACKING METHOD AND TOOL FOR DOWNHOLE OIL WELLS

Harry W. Kompanek, 153 Rametto Rd., Santa Barbara, Calif. 93108

Filed Apr. 27, 1979, Ser. No. 33,854

Int. Cl.[3] **E21B** *43/04*

U.S. Cl. 166—249 **20 Claims**

5. In combination for preventing sand from flowing into a pump for an oil well,

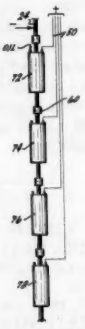
transducer means constructed to vibrate at a frequency having a lower harmonic in the range of approximately 1100 Hertz to 1700 Hertz to produce sound waves having substantially omni-directional characteristics in planes substantially perpendicular to the pump and having considerable energy as a result of such vibrations,

means for energizing the transducer means to produce vibrations of the transducer, and

means for supporting the transducer means from the bottom of the pump for the production of the energy with omnidirectional characteristics in planes substantially perpendicular to the oil well,

the transducer means including at least one slotted transducer supported within a slotted ring to provide for a generation by the transducer of considerable amounts of energy in the range of approximately 1100 Hertz to 1700 Hertz without breaking the transducer.

7. A method of packing gravel around a well bore to prevent



sand from entering into the well bore, including the following steps:

clamping a transducer at at least one of a plurality of spaced antinodal positions around the periphery of the transducer to obtain vibrations of the transducer at a particular harmonic without obtaining vibrations of the transducer at a fundamental frequency,

disposing the transducer at the bottom of a well, and

energizing the transducer to vibrate the transducer at the particular harmonic.

4,257,483

METHOD OF WELL COMPLETION WITH CASING GEL

Earl F. Morris, Wagoner, Okla.; Dustin L. Free, Midland, Tex.; Roland L. Root, Tulsa, and Thomas J. Griffin, Jr., Sand Springs, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 11, 1979, Ser. No. 2,772

Int. Cl.[3] **E21B** *33/14*

U.S. Cl. 166—292 **15 Claims**

1. A well structure of the type including a first conduit penetrating a subterranean formation, a second conduit concentrically suspended within said first conduit, the outer surface of the second conduit and the inner surface of the first conduit defining an annulus, set cementitious material in the annulus over a portion of the length of the second conduit bonding the second conduit to the first conduit over said portion, and an aqueous casing gel in the annulus over another portion of the length of the second conduit, the improvement which comprises: as the casing gel,

(a) water

(b) a water soluble alkali metal silicate; and

(c) a water soluble metal compound capable of releasing a multivalent metal cation to react with the water soluble silicate

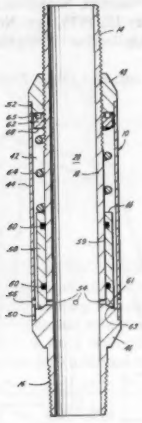
said components (a)–(c) being provided in amounts effective to form an aqueous gel.

4,257,484

PRESSURE DIFFERENTIAL CIRCULATING VALVE

Oran D. Whitley, 1506 N. Colpitts, and James B. Pogue, Rte. 1, Box 78-A, both of Ft. Stockton, Tex.

Filed Mar. 10, 1980, Ser. No. 128,993
Int. Cl.³ G05D *11/03*
U.S. Cl. 166—325 **11 Claims**



8. A pressure differential circulating valve for connection into and to form a portion of a string of pipe in a well bore comprising,

a tubular body having means at its ends for connection in and to form the portion of the string of pipe,

the body having an unrestricted passageway therethrough of substantially the same size and shape as that of the tubing string communicating with and forming a portion of the tubing string passageway,

an annular chamber disposed exteriorly of the body and of an external size effective to permit disposition thereof within and spaced from walls of the well bore,

a tubular slide valve slidably disposed about the body in the annular chamber,

seal means associated with the body and the tubular slide valve effective to provide a seal between the body and the tubular slide valve,

inner ports extending through the body disposed between a first end of the slide valve and the seal means,

a mating annular valve surface adjacent the one end of the slide valve and a mating annular valve seat outwardly of the inner ports,

spring means disposed in the annular chamber yieldingly maintaining the slide valve in a position to sealing close the annular valve surface against the annular valve seat thereby with the seal means closing the inner ports during normal flow pressures in the passageway in the tubular body but yieldable to predetermined flow pressure high than the normal flow pressures, and

outer ports providing fluid communication between the annular chamber and the well bore,

whereby during normal flow through the passageways in the string of pipe and in the tubular body, the slide valve is closed thereby closing the inner ports, and application of flow pressure in the passageways of the string of pipe and in the annular body at least as high as the predetermined flow pressure unseats the annular valve surface from the annular seat and forces the slide valve away from the annular seat uncovering the inner ports thereby permitting the flow of fluid from the passageway in the tubular body through the inner ports into the annular chamber and out the outer ports into the well bore,

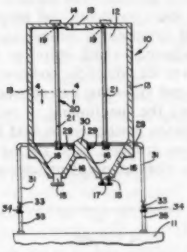
the spring means forcing the slide valve to its closed position upon reduction of flow pressure below the predetermined flow pressure thereby sealing the passageway in the tubular body.

4,257,485

SPONGE IRON STORAGE HOPPER HAVING A SENSOR AND AN INERT GAS SUPPLY

Larry A. Coccia, Elizabeth, Pa., assignor to Pullman Incorporated, Chicago, Ill.

Filed Oct. 19, 1979, Ser. No. 86,550
Int. Cl.³ A62C *37/04*
U.S. Cl. 169—61 **10 Claims**



1. In a storage bin having upright walls, a roof and lower discharge outlets, the improvement of temperature sensor and cooling means comprising;

a sensor support means within said bin,

a sensor means connected to said sensor support means,

said sensor means extending substantially the vertical extent of said bin, and

inert gas supply means within said bin,

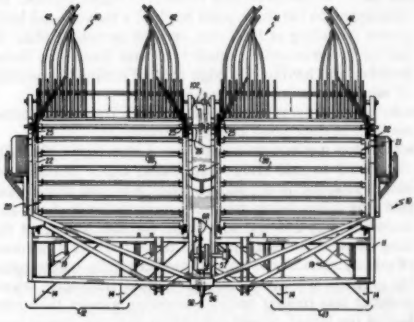
said inert gas supply means being operably connected to said sensor means and being adapted to supply inert gas to said bin upon a predetermined rise in temperature within said bin.

4,257,486

MULTIPLE ROW HARVESTER FOR PEANUT CROPS

Oliver K. Hobbs, P.O. Box 1306, Suffolk, Va. 23434

Filed Jan. 16, 1979, Ser. No. 3,862
Int. Cl.³ A01D *29/00*
U.S. Cl. 171—101 **15 Claims**



1. An apparatus for plowing four rows of root plants disposed in substantially parallel spaced rows and deposit them in a turned position on the ground as two windrows comprising: a frame having wheel means for moving said frame over said rows of plants; two sets of plow shares attached to said frame having two plow shares in each set, said plow shares in one set having their leading ends oriented in one direction with the

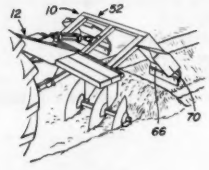
leading ends of the other set oppositely oriented, each plow share adapted to remove a ribbon of plants; a rotary coulter wheel positioned between said two sets of plow shares for cutting overlapping vines between the second and third rows of plants; two parallel conveyors positioned on said frame, each conveyor having a surface for receiving and elevating said ribbons of plants uprooted by a set of plow shares, one conveyor positioned behind one set of plow shares and the other conveyor positioned behind the other set of plow shares, each of said conveyors having separate sprocket drive chain means for rotating said conveyor surfaces in unison and shaking soil from the plants on said conveyor, each of said drive means powered from a common power source; spaced projection means operatively positioned in the area of the sides of the surface of each of said conveyors and projecting outwardly above said sprocket drive chain means, each of said spaced projection means adapted to pull uprooted foliage and vines onto said conveyors at the side of the conveyors, and means for cutting any foliage and vines that extend over the sides of the conveyors to protect the functioning of said sprocket drive chain means; and means positioned on said frame for turning the ribbons of plants dropped from the upper end of each conveyor, with the ribbons of plants deposited in a single windrow.

4,257,487

WATER STOP ATTACHMENT AND BORDER DISC

Manuel D. Brown, 21855 Walnut St., Riverdale, Calif. 93627

Filed Jan. 16, 1979, Ser. No. 4,052
Int. Cl.³ A01B *49/02*
U.S. Cl. 172—140 **5 Claims**



1. An irrigation ditch dam forming apparatus comprising:

a main transverse frame member comprising a pair of rectangular tubular members permanently affixed in lateral alignment to each other;

hitch means mounted to said transverse frame member for attachment to the three point hitch of a tractor, said hitch means including at least one vertical mounting plate attached in surmounting relation to said transverse frame member and having one edge thereof inclined forwardly of said transverse frame member;

border disc apparatus attached to said transverse frame member in depending relation thereto;

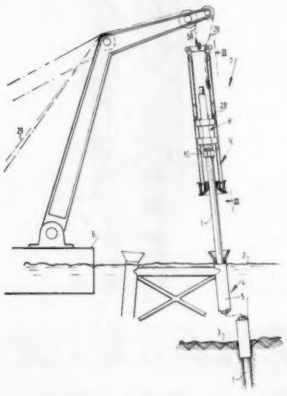
a water stop mechanism comprising a stop frame pivotally connected to said transverse frame, and a plurality of blades attached in depending relation to said stop frame, said stop frame being generally rectangular in shape and including a cylindrical rod frame member as one of the long sides of the rectangle, and further wherein portions of said cylindrical rod are disposed coaxially within tubular sections which are affixed to said transverse frame member said tubular sections covering greater than one-half of the length of said cylindrical rod, the coaxial relationship forming said pivotal connection, a second frame member comprising an elongated tube disposed parallel to said cylindrical rod and constituting the second long side of the rectangle, and three connecting frame members connected between and spaced along said cylindrical rod frame member and second frame member each of said connecting frame members comprising a tube, a lifting means attached between and in surmounting relation to said inclined edge of said mounting plate and said stop frame for causing pivoting of said stop frame.

4,257,488

GUIDE FRAME FOR A PILE DRIVING DEVICE

Hans G. Schnell, Hamburg, Fed. Rep. of Germany, assignor to Van Kooten B.V., Naarden, Netherlands

Filed May 15, 1975, Ser. No. 577,844
Claims priority, application Netherlands, May 20, 1974, 7406774
Int. Cl.³ E02D *7/00*
U.S. Cl. 173—133 **3 Claims**



1. A guide framework for guiding the pile driving hammer of a pile driving assembly for driving piles into subaqueous ground, comprising a socket and at least one guide stay for guiding the hammer assembly, said socket comprising a tubular member having an axial passage slidingly and movably surrounding the pile to permit relative sliding movement therebetween, and a cone rigidly connected to said tubular member at the lower side thereof and joining the same, said cone diverging downwards, said socket having a vertical guide recess formed therein associated with each guide stay for receiving the lower end of its associated guide stay therein, said guide stay and said socket each having lock bolt guides formed therein positioned to be aligned when the guide stay is in the socket, and a lock bolt received in said lock bolt guides extending transversely through said stay and said socket for detachably securing said guide stay to said socket.

4,257,489

PRESSURE FLUID POWERED MACHINE TOOL

Sven P. J. Westerberg, Saltsjöbaden, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 7, 1978, Ser. No. 967,219
Claims priority, application Sweden, Dec. 7, 1977, 7713874
Int. Cl.³ B23Q *5/00;* **E21C** *500*
U.S. Cl. 173—159 **13 Claims**

1. In a pressure fluid powered machine tool comprising:

a housing (**10**) having a cylinder bore (**11**) therein,

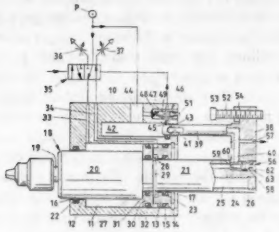
a motor unit (**18**) displaceably guided in said cylinder bore (**11**) and having at least a forward end extending out of said cylinder bore (**11**), said motor unit (**18**) comprising at its forward end an output shaft (**19**) for connection to a working tool,

piston means (**30**) cooperatively coupled to said motor unit (**18**) and sealingly guided in said cylinder bore (**11**) for axial displacement of said motor unit (**18**) relative to said housing (**10**),

the improvement comprising:

a pressure chamber (42) in said housing (10) and extending in a parallel offset relationship to said cylinder bore (11), and

a pressure fluid feed tube (39) rigidly connected at one end thereof to the motor unit (18) and extending in a parallel



offset relationship to the motor unit, said feed tube being sealingly coupled to said pressure chamber (42), said feed tube (39) having an internal passage coupling said motor unit (18) and said pressure chamber (42) to thereby establish a fluid communication between said pressure chamber (42) and said motor unit (18).

4,257,490

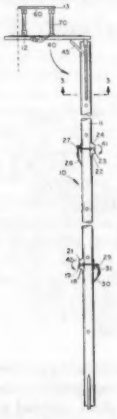
PORTABLE OBSERVATION STAND

Irvin C. Bandy, 614 E. Swayzee St., Marion, Ind. 46952

Filed Jun. 7, 1979, Ser. No. 46,452

Int. Cl.³ E06C *7/48, 1/08*

U.S. Cl. 182—116 **6 Claims**



1. A portable observation stand comprising:

a collapsible ladder with a base supporting bottom portion and a top portion;

a platform mounted pivotally to said top portion of said ladder and including a tree embracing edge and a top surface;

a flexible line with one end attached to said platform and an opposite free end and having sufficient length to extend around a tree;

tightening means engagable with said free end of said line and operable to pull said line tight to force said tree embracing edge against a tree;

platform erecting means mounted on said ladder and engagable with said platform operable to hold said platform horizontally until secured to a tree by said line and tightening means;

said ladder when erected includes a vertically extending pole with outwardly extending footholds, said pole including multiple sections pivotally connected together and collapsible against said platform when in a stored position;

said sections include a pair of aligned and adjacent sections having arms extending outwardly and pivotally interconnected with one of said pair of sections having a first pin receiving hole and the other having a first tab with aperture alignable with said hole when said sections are erected, said ladder including a first pin removable extendable through said aperture and hole to secure said pair of sections together;

said tightening means includes a threaded member rotatably mounted to said platform and a hook engagable with said line and pivotally mounted to said platform, said threaded member is operably engaged with said hook to pull said line past said tree embracing edge with said edge and line gripping said tree therebetween;

said sections include a third section aligned and adjacent one section of said pair of sections with a second tab and second pin securing said third section to said one section of said pair, said second tab and said second pin located on a side of said ladder opposite said first pin and said first tab stabilizing said ladder when erected;

a seat with a pair of rear legs pivotally attached thereto and extending downwardly and pivotally mounted to said platform adjacent said tree embracing edge and further including one front leg pivotally mounted to said seat and abuttable atop and against said platform.

4,257,491

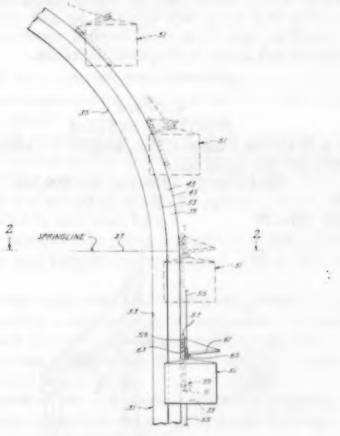
SCAFFOLD APPARATUS

Homer H. Presnall, Jr., and Earl G. Cutler, both of San Antonio, Tex., assignors to Prescon Corporation, San Antonio, Tex.

Filed Jan. 29, 1979, Ser. No. 7,417

Int. Cl.³ E04G *3/12, 3/10, 3/16*

U.S. Cl. 182—142 **18 Claims**



1. Scaffold apparatus comprising

a car adapted to move over a surface curved in elevation;

positionable means adapted to be positioned relative to such surface;

said positionable means including connector means for use in making a pivotal connection to a scaffold,

support means movably mounting the connector means on the car,

thrust means for moving the connector means relative to the car;

said car including a chassis carrying rotatable means to support the car on such surface and a boom extending

transversely to the chassis providing said support means for the connector means; and

said boom including a pair of racks each connected at one end to the chassis and a cross member reciprocably movable on said racks, said connector means including a pair of hangers positioned on said cross member.

4,257,492

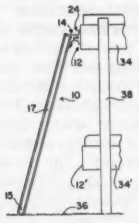
BUNK LADDER ANCHOR

Frank M. Rasada, Jr., 7912 LaRiviera Dr., Sacramento, Calif. 95826, and John A. Starr, 1856 Cherry Ave., Long Beach, Calif. 90806

Filed May 21, 1979, Ser. No. 40,747

Int. Cl.[3] E06C *1/36, 7/48*

U.S. Cl. 182—206 **6 Claims**



1. A ladder attachment for removably securing the top of a ladder to an elevated support comprising:

a bracket having a base for mounting at the upper end of a ladder rail and having a hook with a crook disposed concave downward projecting from said base and a nose portion extending outwardly transverse to said crook, and

a socket for attachment to said support and having an overhanging lip and a shoulder spaced therebeneath to define a gap with a lateral opening and a spaced abutment to receive said hook, whereby said lip and said shoulder immobilize said hook from vertical movement relative thereto and against withdrawal therefrom.

4,257,493

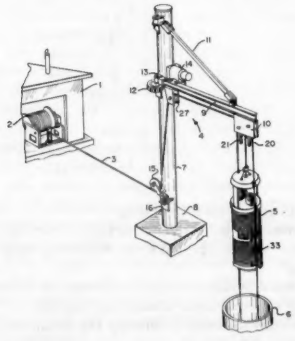
HOISTING SYSTEM

David E. Beckham, Ferguson, Mo., assignor to Unidynamics/St. Louis, Inc., St. Louis, Mo.

Filed May 25, 1978, Ser. No. 909,505

Int. Cl.[3] B66B *11/04*

U.S. Cl. 187—20 **14 Claims**



1. A hoisting system for use in elevating personnel or the like, comprising, a capsule disposed for approximate vertical movement between various levels, singular cable means operatively associated with the capsule and provided for controlling the movement of the capsule between the desired levels, tension weight means aligned beneath the capsule and suspended by the same singular cable means and disposed for variable movement relative to said capsule particularly during system installation and removal, cable handling means including a sheave assembly provided upon the tension weight means to facilitate the cable transfer during system usage, support means arranged over the capsule and tension weight means and functioning to facilitate the cable transfer, cable handling means including a sheave assembly provided upon the support means to facilitate the cable transfer during system usage, cable handling means including a sheave assembly provided upon the upper side of the capsule to facilitate the cable transfer during system usage, said tension weight means being of substantially greater weight than the weight of the said capsule, whereby during operation of the hoisting system the singular cable means allows the tension weight means to initially descend for placement before the capsule functions to raise or lower between the support means and the tension weight means during continuing feed-out or withdrawal of the singular cable means upon the various sheave assemblies.

4,257,494

SAFETY BRAKE FOR ELEVATORS AND AERIAL CABLEWAYS

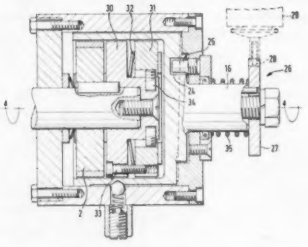
Manfred Frankel, Hof, Fed. Rep. of Germany, assignor to Söll Kommanditgesellschaft, Industrieschmiede, Hof, Fed. Rep. of Germany

Filed Apr. 19, 1979, Ser. No. 31,501

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818600

Int. Cl.[3] B66B *5/16*

U.S. Cl. 187—89 **9 Claims**

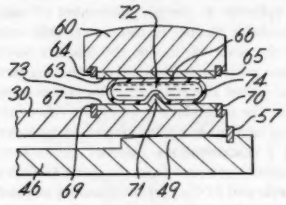


1. A safety brake for decelerating an elevator cabin, a cable car or the like moving along guide means said safety brake comprising a transmission shaft adapted to be driven by said guide means through transmission means, a speed limiter mounted on the transmission shaft including a centrifugal brake having centrifugal weights carrying brake linings, a brake disc mounted on the end of the transmission shaft, a housing, a brake bell surrounding the speed limiter and the brake disc so that said brake bell will be frictionally engaged and rotated by the brake linings carried on the centrifugal weights of the speed limiter when the triggering speed is exceeded, said bell being supported in said housing for rotation and for axial movement between an inoperative position in which said bell does not engage said brake disc and an operative position in which said bell frictionally engages said brake disc, and means for axially displacing the brake bell from said inoperative position to said operative position upon rotation of said bell through less than one complete rotation and for limiting the rotation of the brake bell to less than one complete rotation.

4,257,495
DAMPING DEVICE

Forbes G. de Brie Perry, Forest Row, England, assignor to National Research Development Corporation, London, England

Filed May 7, 1979, Ser. No. 36,507
Claims priority, application United Kingdom, May 10, 1978, 18703/78
Int. Cl.³ F16F 9/10
U.S. Cl. 188—1 B **12 Claims**

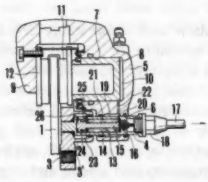


1. Apparatus including a fixed casing, a generally circular control member within said fixed casing, and a device for damping radial and axial motions of said control member, said device comprising:
- a first surface associated with said control member;
- an element restrained from radial and axial movement relative to said fixed casing;
- a second surface associated with said element;
- said first and second surfaces defining between them an annular space, the axial dimension of which exceeds the radial distance between said surfaces;
- a flexible toroidal envelope located within said space and filled with a viscous fluid, and
- means for constraining said flexible envelope when so located so that the cross-section said envelope presents to the flow of the fluid within said envelope from one axial end thereof to the other is relatively great in the vicinity of the two axial ends but is less at at least one point intermediate to those ends.

4,257,496
DISC BRAKE OF HYDRAULICALLY OPERATED TYPE

Tomohiro Fujita, Hanyo; Kennosuke Iida, Iwatsuki, and Kazuo Kawase, Kuki, all of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1979, Ser. No. 46,038
Claims priority, application Japan, Jun. 13, 1978, 53-71040
Int. Cl.³ F16F 55/224
U.S. Cl. 188—72.6 **5 Claims**



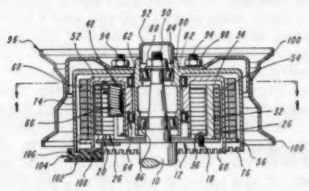
1. A disc brake comprising a pair of friction pads disposed on both sides of a disc to be braked to confront each other across the disc, a guide shaft and a caliper which is provided with a thrusting piston disposed therein for pushing one of said friction pads against said disc with hydraulic pressure and is arranged to push the other friction pad against said disc as said caliper is guided on the guide shaft, said disc brake being characterized in that:

said disc brake incorporates a hydraulic pressure generator, said hydraulic pressure generator is disposed within said guide shaft and is provided with a cylinder which is formed within said guide shaft, a hydraulic pressure generating piston which slidably engages said cylinder, and a hydraulic pressure generating chamber; said hydraulic pressure generating chamber communicates, through a passage means, with a hydraulic operation chamber which exerts hydraulic pressure on the thrusting piston; and said hydraulic pressure generating piston is operated by an external force to raise hydraulic pressure within said hydraulic pressure generating chamber for performing a braking action by driving said thrusting piston with said hydraulic pressure.

4,257,497
MAGNETICALLY TRIGGERED AND ELECTRONICALLY CONTROLLED TORSION BRAKE

Karl S. Schroeder, Clayton, Ohio

Continuation-in-part of Ser. No. 777,355, Mar. 14, 1977, abandoned. This application Nov. 17, 1978, Ser. No. 961,874
Int. Cl.³ F16D 51/04
U.S. Cl. 188—77 W **17 Claims**



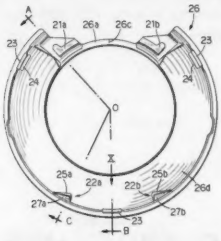
1. A brake for a vehicle wheel, comprising:
- an inner hub supported for rotation about the axis of rotation of said wheel;
- an outer hub supported for rotation about said axis;
- a helically wound torsion spring located between said inner hub and said outer hub and connected between said inner hub and said outer hub so that the rotation of said wheel is imparted to said inner hub;
- a helically wound brake spring located within said inner hub adjacent and surrounded by an inner wall of said inner hub;
- support means supporting said brake spring within said inner hub including a support plate adapted to be nonrotatably attached to a vehicle and a spider member attached to said support plate and generally disposed within the convolutions of said brake spring;
- a first abutment on said support plate for engaging and restraining rotation of one end of said brake spring in one direction about said axis;
- a second abutment on said spider member for engaging and restraining rotation of the outer end of said brake spring in an opposite direction about said axis;
- first and second electromagnets attached to said support means for radially outwardly biasing portions of said brake spring near said one and said other ends so that said brake spring may expand radially to self wrap against and engage and abruptly stop the rotation of said inner hub in either direction; and
- electrical circuit means for selectively energizing said first and second electromagnets to accomplish the biasing of said portions of said brake spring.

4,257,498

ANTI-RUST COVER FOR A DISC ROTOR OF A VEHICLE DISC BRAKE

Tomoyuki Nogami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 9, 1979, Ser. No. 65,050
Claims priority, application Japan, Jul. 4, 1979, 54-46107[U]
Int. Cl.³ F16D *65/00*
U.S. Cl. 188—218 A **7 Claims**



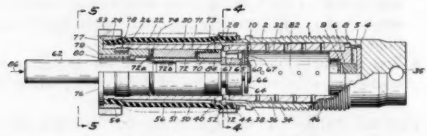
1. In an anti-rusting arangement for a disc rotor of a vehicle disc brake which includes a disc rotor integrally rotatable with a wheel, a dust cover coving the inner side of the disc rotor and an anit-rust cover faced toward and covering the outer side of the disc rotor, the anti-rust cover being retained by being removably attached to the outer periphery of the dust cover, an improvement wherein said anti-rust cover is provided, for attaching said anti-rust cover to said dust cover, with a combined engaging means comprising at least three engaging members including at least one inside engaging member and at least one outside engaging member located radially outside, in relation to a surface of said anti-rust cover which is faced toward said dust cover, than said at least one inside engaging member, all of said engaging members, at least three in all, being arranged alternatively along the circumferential direction on said surface of said anti-rust cover with a predetermined distance to each other securely holding the outer periphery of said dust cover fitted between said inside and said outside engaging members.

4,257,499

HYDRAULIC CARTRIDGE FOR IMPROVED MOTION CONTROL

Richard E. Deschner, 5550 Harcross Dr., Los Angeles, Calif. 90043

Continuation of Ser. No. 783,006, Mar. 30, 1977, abandoned. This application Dec. 29, 1978, Ser. No. 974,238
Int. Cl.³ F16F *9/19, 9/346, 9/42*
U.S. Cl. 188—287 **24 Claims**



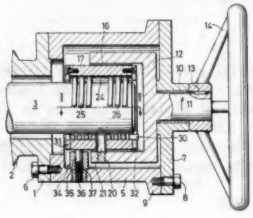
1. A hydraulic cartridge of the type having a body supporting a sealed enclosure containing fluid, said enclosure containing a high pressure chamber and low pressure reservoir space, a reciprocative plunger having a working stroke and a first portion external of said enclosure adapted to receive actuating loads, said plunger having a second portion connected to the first portion and extending within the enclosure, there being a fluid seal encircling said plunger between said first and second portions, said second portion extending through a primary part of the reservoir space to the high pressure chamber and forming a movable barrier between the high pressure chamber and said primary part of the reservoir space to resist movement of the plunger, wherein the improvement comprises: a cylinder having intrinsically a wall with inner and outer surfaces and first and second open ends, a tubular jacket member secured to the cylinder having intrinsically one open muzzle end and one end at least partially enclosed, said jacket encircling a portion of the length of said cylinder, a closure for the second end of said cylinder retained by said jacket, there being passage means for flow of fluid from said high pressure chamber between the jacket and cylinder to permit movement of said plunger, a flexible expandable bladder forming a variable volume secondary part of the reservoir space, the bladder having first and second anchor portions respectively encircling portions of said cylinder and jacket thereby enclosing the muzzle end of the jacket within the secondary part of the reservoir space, and means sealing said anchor portions to said cylinder and jacket, there being a discontinuous external circumferential flange extending radially outward from the outer surface of the cylinder, the muzzle end of the jacket extending beyond said flange and being swaged radially inward forming an annular header chamber encircling said cylinder and forming a passageway communicating with flow passages leading from the high pressure chamnber and the primary and secondary reservoir spaces.

4,257,500

HAND DRIVE FOR COUPLING TO A ROTATABLE SHAFT

Alfred Brunner, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 2, 1979, Ser. No. 35,282
Claims priority, application Switzerland, May 12, 1978, 5180/78
Int. Cl.³ F16D *13/12, 67/00, 47/04*
U.S. Cl. 192—35 **6 Claims**

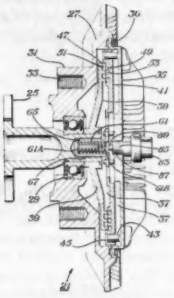


1. In combination with a roatatably driven shaft;
a hand wheel assembly for manual turning of said shaft;
a coupling for coupling said hand wheel assembly onto said shaft, said coupling including a sleeve disposed in concentric relation about said shaft and defining a gap with said shaft, a pair of coil springs in said gap concentrically between said sleeve and said shaft, each said spring having one end secured to said sleeve and convolutions radially biassed into engagement with said sleeve and spaced from said shaft, and a driver connected to said hand wheel assembly and passing through a slot in said sleeve in spaced relation to an opposite end of each coil spring for engaging with said opposite end of a respective coil spring in dependence on the direction of rotation of said hand wheel assembly to cause said convolutions of said respective spring near said opposite end to disengage from said sleeve and engage with said shaft to rotate said shaft; and
a static brake abutting said sleeve to restrain rotation of said sleeve relative to said shaft and hand wheel assembly.

4,257,501
TEMPERATURE RESPONSIVE FAN CLUTCH FOR VEHICLE ENGINE

Robert L. Woods, Fort Worth, Tex., assignor to Eaglemotive Industries, Inc., Fort Worth, Tex.

Filed Mar. 26, 1979, Ser. No. 23,833
Int. Cl.³ F16D *35/00*
U.S. Cl. 192—58 C **6 Claims**



6. A temperature responsive clutch for the radiator cooling fan of a motor vehicle engine, comprising:

a shaft to be attached to the fan mounting of said engine,

a housing rotatably mounted on said shaft by bearing means, said housing having means for mounting a fan,

said housing comprising a front housing plate and a rear housing plate attached together to form an enclosed chamber for holding a viscous fluid,

a rear inner plate fixedly attached to said shaft within said chamber,

a front inner plate located in said chamber and coupled to said front housing plate for rotation there with and for axial movement relative to said front housing plate and said rear inner plate,

said front inner plate having aperture means formed therethrough and spaced from the axis thereof,

a spring mounting member having support structure extending through said aperture means and connected to said front housing plate, and further having inside structure,

spring means having one end in engagement with the inside structure of said spring mounting member and the other end in engagement with the rear side of the center portion of said front inner plate for urging said front inner plate away from said rear inner plate, and

temperature responsive means supported by said front housing plate and having a moveable element located within said chamber for engaging and moving said front inner plate toward said rear inner plate when the temperature increases to a high level whereby said front inner plate and, hence, said housing are rotated due to the shear force of said viscous fluid between said rear and front inner plates.

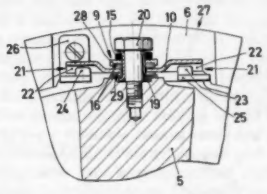
4,257,502
DISK CLUTCH WITH TWO DRIVEN DISKS

Hans-Walter Riese, Schwebheim, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 8, 1978, Ser. No. 958,876
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1977, 2751357
Int. Cl.³ F16D *13/52, 13/75*
U.S. Cl. 192—70.25 **9 Claims**

1. In a clutch including two clutch disks, a pressure plate, an intermediate plate, and a clutch cover mounted for rotation about a common axis and movable relative to each other in the direction of the common axis, and operating means for moving said pressure plate relative to said clutch cover in the direction of the common axis, one of said clutch disks being interposed between said pressure plate and said intermediate plate, and said intermediate plate being interposed between said two clutch disks, the improvement which comprises:

(a) a plurality of two-armed levers each having a middle portion with a pair of arms with each arm extending outwardly from said middle portion on the opposite side thereof from said other arm said middle portions secured to angularly spaced apart portions on the circumferen-



tially extending surface of said intermediate plate for movement about respective pivot axes extending approximately radially of said common axis and through said intermediate plate;

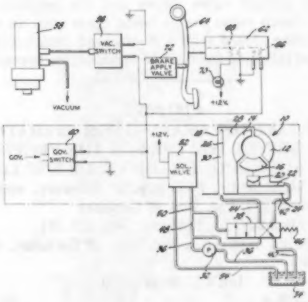
(b) first hinge means associated with each lever and pivotally securing one said arm of the associated lever to said pressure plate; and

(c) second hinge means associated with each lever and pivotally securing the other said arm of the associated lever to said clutch cover.

4,257,503
DISENGAGEMENT CONTROL FOR A TORQUE CONVERTER CLUTCH

Edward T. Lutnick, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 29, 1979, Ser. No. 7,022
Int. Cl.³ F16D *41/04*
U.S. Cl. 192—3.23 **4 Claims**



1. In a vehicle having operator actuated vehicle brakes and a solenoid controlled torque converter clutch which is disengaged in response to a solenoid valve being energized, a vehicle brake actuator, a brake signal circuit, brake signal switch means actuated in response to movement of said vehicle brake actuator for energizing a brake signal circuit, and solenoid control switch means conditioned to normally deenergize the solenoid valve and being actuated by said vehicle brake actuator to energize the solenoid valve prior to brake signal switch actuation whereby disengagement of said torque converter clutch is initiated upon movement of said vehicle brake actuator prior to energization of the brake signal circuit.

4,257,504

HYDRODYNAMIC RETARDER FOR VEHICLES, ESPECIALLY FOR MOTOR VEHICLES

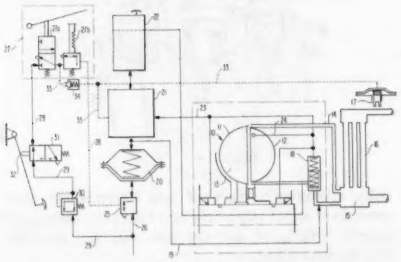
Hans Hanke, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,567

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 2710870

Int. Cl.³ F16D *67/04*

U.S. Cl. 192—12 A **13 Claims**



1. A retarder for vehicles comprising an internal working circulation means within a working space means between at least one rotating blade wheel and at least one fixed blade wheel, an external cooling circulation means associated with said working space, means including a pressure medium actuated filling means having a pressure medium inlet line for filling the working circulation means, the actuation of said filling means being controllable by an actuating device by means of a control valve means associated therewith, a relay valve means being arranged in the pressure medium inlet line to the filling means which, in its turn, is controllable by the actuating device associated therewith by means of the control valve means, said pressure medium inlet line including a first branch to the relay valve means and a second branch to said control valve means, and a pressure limiter means being interconnected in the second branch, characterized in that a clutch valve means actuatable by the clutch actuation is arranged between the control valve means and the pressure limiter means, said clutch valve means being open with an engaged clutch and being closed with a disengaged clutch and in the latter position relieving the control valve means towards zero.

4,257,505

POWER TAKE-OFF GEARING FOR OPERATING SEPARATE DRIVES, FOR USE FOR THE PROPELLERS OF AN AMPHIBIOUS VEHICLE, OR THE LIKE

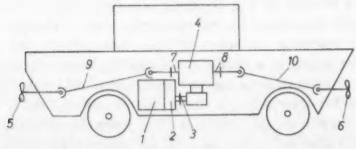
Enno Stodt, Heidenheim, Fed. Rep. of Germany, assignor to Voith Getriebe KG, Fed. Rep. of Germany

Filed Jul. 26, 1978, Ser. No. 928,291

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1977, 2741476

Int. Cl.² B60F *3/00*

U.S. Cl. 192—18 A **21 Claims**



1. Power take-off gearing for an amphibious vehicle, for operating two separate propellers of the vehicle, comprising:

a common drive having a drive shaft;

a first and a separate second driven shaft for being driven by said drive shaft; a respective first propeller connected to said first driven shaft for being rotated thereby and a respective second propeller connected to said second driven shaft for being driven thereby;

a first slip clutch between said common drive and said first driven shaft; a second slip clutch between said common drive and said second driven shaft;

first control means for selectively controlling the slippage of said first clutch; second control means for independently selectively controlling the slippage of said second clutch,

whereby the rotation rates of said driven shafts are independently adjustable.

4,257,506

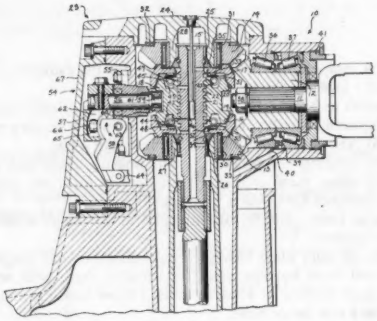
SHIFTER LINKAGE FOR A CONE CLUTCH

Herbert A. Bankstahl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 30, 1979, Ser. No. 34,520

Int. Cl.³ F16D *13/28, 21/04*

U.S. Cl. 192—21 **11 Claims**



1. A clutch apparatus comprising:

(A) a main shaft;

(B) a forward gear freely rotatable about said main shaft, said forward gear having a clutch face on one side;

(C) a reverse gear having a clutch face on one side, said reverse gear freely rotatable about said main shaft with said clutch faces facing each other;

(D) a drive gear meshed with said forward and reverse gears for driving said gears in respectively opposite directions of rotation;

(E) a sleeve member mounted on said main shaft between said forward and reverse gears, said sleeve member having:

(a) a clutch face at each end, each selectively engageable with one of said clutch faces of said forward and reverse gears and

(b) an exterior circumferential groove in said sleeve member between said clutch faces; and

(F) a shift means for engaging with said groove and selectively moving said sleeve member axially along said shaft to a forward or reverse drive position to engage one of said sleeve clutch faces with one of said forward or reverse gear clutch faces, said shift means having:

(a) a vibrating means to selectively provide a vibrating force to disengage said one of said sleeve clutch faces from said one of said forward or reverse gear clutch faces, said vibrating means including:

(i) an actuator shaft extending into said groove and

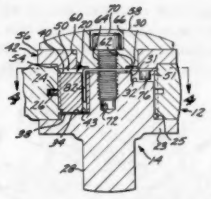
(ii) a roller mounted for rotation on said actuator shaft within said groove, said roller having at least one lobe relative to its axis of rotation to provide said vibrating force.

4,257,507

TORQUE WRENCH WITH PAWL GUIDE

Donald F. Solomon, Newport Beach, Calif., assignor to JO-Line Tools, Inc., Anaheim, Calif.

Filed Aug. 15, 1978, Ser. No. 934,045
Int. Cl.[3] F16D 11/06
U.S. Cl. 192—43.1 9 Claims



1. In a torque wrench having a hinge with a ratchet body including a cavity formed with an interior wall element having a plurality of equally spaced, interiorally directed axially elongated ratchet body teeth, a work head received in said cavity for releasable coupling in rotation with said ratchet body, and a pawl element received within said cavity for translational travel transversely thereon and having an exterior arcuate surface with exteriorally directed teeth engageable with said ratchet body teeth and selectively operable to couple said work head and said ratchet body in rotation, the improvement comprising:

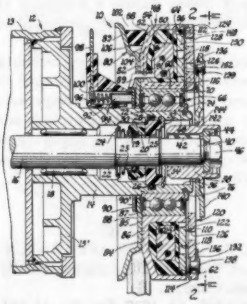
guide means for maintaining said teeth of said ratchet body and said teeth of said pawl in substantially axially parallel alignment and including male means rigidly mounted on one of said elements and projecting perpendicularily of the axial direction of said teeth and female means on the other of said elements and slidably receiving said male means for free relative translational movement between said male and female means in a plane perpendicular to said teeth.

4,257,508

ELECTROMAGNETIC ROTATING COIL CLUTCH

George T. Bennett, Kettering, and Byron L. Brucken, Miamisburg, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1979, Ser. No. 66,615
Int. Cl.[3] F16D 27/06
U.S. Cl. 192—84 A 3 Claims



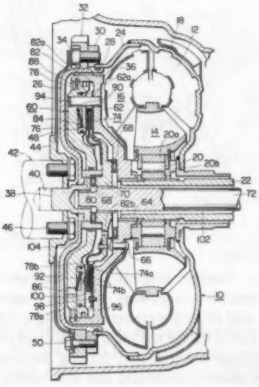
1. For use with a casing having a fixed tubular extension extending from an end surface thereof and a drive shaft extending centrally through said tubular extension, a readily assembled, electromagnetic clutch of reduced weight comprising an annular one-piece rotatable coil housing member defined by walls C-shaped in cross-section and opening away from said casing to form one-half of a driven means, an annular one-piece rotatable member dish-shaped in cross-section and having a wall thickness thinner than the wall thickness of said coil housing to form the other half of said driven means, said two rotatable members being joined in back-to-back relationship to make said driven means unitary so that the radially outer portions of each define a driven groove portion and the radially inner portion of said dish-shaped member is axially slidably received on said tubular extension to define a bearing cavity with said coil housing and said tubular extension and a support for a slip ring mounted on the opposite side thereof from said bearing cavity, a spring-loaded brush in fixed relation to said casing adjacent said slip ring, an energizable electromagnetic coil mounted in said coil housing through the opening thereof, drive means connected to said drive shaft, an armature plate positioned adjacent said drive means, means for axially movably supporting said armature plate with respect to said drive means and for drivingly interconnecting said armature plate with said drive means, a journal bearing in said bearing cavity including relatively rotatable coaxial inner and outer concentric races, said inner race mounted around said tubular extension with said outer race supporting said coil housing and stopped against the radially inner portion of said dish-shaped member to form a corner juncture flux path so that the inner wall of said coil housing and the outer race of said bearing provide composite axially extending magnetic flux paths, the back-to-back jointure of said two rotatable members providing a composite radially extending magnetic flux path, so that the combined axial, radial and corner juncture flux paths establish a magnetic flux circuit of increased force with said armature plate upon the energization of said coil, thereby to enable said coil housing to be formed of minimal material resulting in a lightweight, readily assembled, electromagnetic rotating coil clutch.

4,257,509

HYDRAULIC CLUTCH WITH DUAL PISTONS

Kazuyoshi Hiraiwa, Ome, and Kotei Takahashi, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Jul. 8, 1977, Ser. No. 814,090
Claims priority, application Japan, Jul. 13, 1976, 51-92320[U]
Int. Cl.[2] F16D 25/00, 47/06
U.S. Cl. 192—86 7 Claims



1. In a hydraulic clutch including: a driving bell-casing rotatable about an axis and constituting a cylinder; a set of first and second pistons coupled in a piston/cylinder relationship with said bell-casing to define a clutch chamber of a variable volume containing a working fluid; a driven clutch disc axially movable along said axis within said clutch chamber and arranged between the set of first and second pistons and one end of said bell-casing so as to be gripped therebetween by move-

ment of the set of first and second pistons toward that end, the movement of the set of first and second pistons toward and away from that end being selectively controlled by the pressure difference of working fluid between inside and outside of said clutch chamber; and a spring interposed between said first and second pistons to urge said first piston away from said second piston generally parallelly to said axis; the improvement comprising:

a guide pin fixed to said bell-casing and mounted in said first and second pistons for providing alignment between said first and second pistons and said bell-casing and preventing the rotation of said first and second pistons relative to said bell-casing;

said first piston constituting an annular parallel-plane plate having parallel, flat contoured side surfaces one of which are contactable with the corresponding surface of said clutch disc when said first piston is moved toward that end;

said second piston having an annular recess corresponding in shape to said first piston, said annular recess constituting a cylinder and receiving in piston/cylinder relationship said first piston; and

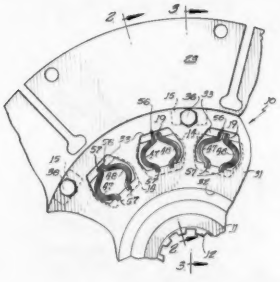
said spring having one end resting on the bottom of said annular recess and the other end engaging said first piston.

4,257,510

NON-LINEAR SPRING RATE CLUTCH DAMPER

Walter Fisher, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 1, 1978, Ser. No. 901,375
Int. Cl.³ F16D *3/14*
U.S. Cl. 192—106.1 **21 Claims**



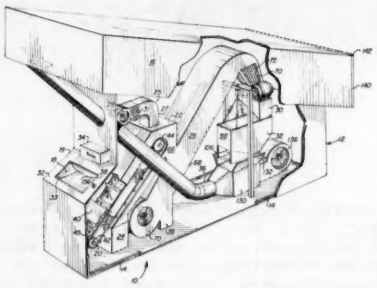
1. A vibration damper assembly for transmitting torque between two elements comprising a driving member and a driven member, said driven member including a hub provided with an integral radial flange having a plurality of circumferentially spaced openings therein, said driving member including at least one plate journalled on said hub and having a plurality of circumferentially spaced openings therein generally axially aligned with the openings in the hub flange, and a spring pack comprising a plurality of closely stacked leaf springs received in each set of aligned openings, said spring pack being divided into two sets of leaf springs oppositely bowed in the direction of rotation and having the opposite end extremities thereof operatively connected to the hub flange and plate such that the opposite end extremities move in opposite circumferential directions when torque is applied to either of the members.

4,257,511

METHOD AND APPARATUS FOR SELECTIVE RECOVERY OF METAL CONTAINERS

John H. Miller, 10 Half Moon Way, Chandler, Ariz. 85224

Continuation-in-part of Ser. No. 754,493, Dec. 27, 1976, Pat. No. 4,179,018. This application Jan. 2, 1979, Ser. No. 28
Int. Cl.³ G07F *1/06*
U.S. Cl. 194—4 R **2 Claims**



1. An apparatus for receiving trash and recovering metallic containers of a pre-selected type from said trash, said apparatus comprising:

(a) a frame;

(b) an inlet hopper for receiving said trash;

(c) first conveyor means located to receive the discharge from said inlet hopper;

(d) magnetic means for retaining ferrous materials on said first conveyor means to convey said ferrous materials to a first location and discharge said nonferrous materials at a second location;

(e) pneumatic conveying means communicating with said second location for conveying materials of predetermined specific weight to a third discharge location;

(f) crushing means receiving material from said third discharge location for reducing the size of materials received;

(g) weighing means receiving discharge from said crusher means;

(h) load cell means responsive to said weighing means and operatively connected to means for issuing compensation related to the weight of material weighed;

(i) control means for regulating the flow of materials into said weighing means during a weighing cycle and for dumping said means upon completion of said weighing cycle;

(j) a microprocessor unit and analog circuit means operatively connected to said load cell, control means, weighing means and means for issuing compensation for establishing zero tare when weighing cycle is initiated; and

(k) second conveying means for receiving the discharge from said weighing means and conveying same to a storage compartment.

4,257,512

COIN ACCEPTOR APPARATUS

Donald E. Hooker, Wilmette, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed Feb. 12, 1979, Ser. No. 11,123
Int. Cl.³ G07F *3/00*
U.S. Cl. 194—100 A **20 Claims**

1. An apparatus for accepting coins of a particular type, comprising:

a first coil and a second coil electromagnetically coupled to the first coil, said coils being arranged to allow a coin to pass therebetween;

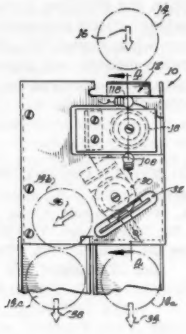
signaling means comprising an oscillator operatively con-

nected to the first coil for energizing the same to induce a signal in the second coil as the coin passes between the coils;

means conductively connected to the signaling means for providing a signal to the second coil having a phase shifted substantially 180° out of phase relative to the signal that is induced in the second coil for cancelling the signal induced in the second coil to a level below a predetermined level, said signal providing means further including means for attenuating the phase shifted signal to the second coil to provide a signal of substantially equal amplitude to a signal that is induced in the second coil when a coin of the particular type passes between the coils, so that the signal of the signal providing means cancels the signal induced in the second coil to a level below the predetermined level in response to a coin of the particular type passing between the coils;

means for detecting the level of the signal induced in the second coil; and

means responsive to the detecting means for accepting the coin when the signal induced in the second coil is below the predetermined level.



4,257,513

MACHINE TOOL

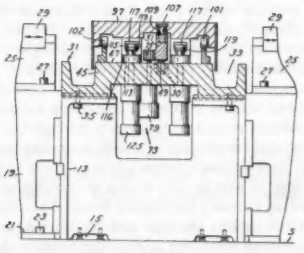
Andrew V. Siarto, West Bloomfield, Mich., assignor to Siarto Machine and Tool Co., Inc., Novi, Mich.

Filed Apr. 26, 1979, Ser. No. 33,638

The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.

Int. Cl.³ B65G 17/00

U.S. Cl. 198—345 **23 Claims**



1. In a machine tool, a support having an upper support surface;

an annular gear overlying and being spaced from said support surface;

a plurality of rollers carried by said support and engaging the undersurface of said gear to support the gear for rotation about a vertical axis;

first and second annular rails on said support surface, one rail on each side of said gear;

said first rail having a cam surface;

a pallet for supporting a workpiece and movable through a pluraltiy of work stations;

means interconnecting said pallet to said gear for rotational movement, yet accommodating limit relative vertical and horizontal movement therebetween;

first roller means carried by the underside of said pallet and engageable with said first rail;

second roller means carried by the underside of said pallet and engageable with said second rail;

a plurality of abutments carried by said support and engageable with said pallet when at a work station whereby said pallet is supported solely by said abutments and not by said gear, with said first and second roller means being spaced from said rails a small vertical distance;

clamping means carried by said support engageable with said pallet for clamping the pallet to said abutments when at a work station;

indexing means on said support for rotating said gear and thereby moving said pallet, between work stations, whereby said first rail cams said first roller means upwardly thereby lifting the corresponding edge of said pallet to a transfer position and lowering said second roller means to engage said second rail, and said pallet being lifted out of engagement with said abutments, resulting in the pallet and its workpiece carried by said rails and not by said gear, as said gear is rotated to move said pallet to the next work station.

4,257,514

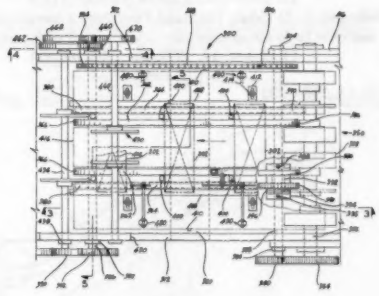
CONVEYOR APPARATUS WITH ALIGNMENT MEANS

Hubert R. Ver Mehren, Florissant, Mo., assignor to Ga-Vehren Engineering Company, St. Louis, Mo.

Filed Jun. 29, 1978, Ser. No. 920,537

Int. Cl.³ B65G 47/26, 47/31

U.S. Cl. 198—459 **7 Claims**



1. A conveyor apparatus with alignment means for articles carried thereon, the conveyor apparatus comprising:

(a) support means having a longitudinal axis and opposed sides,

(b) an endless flexible conveyor means having interconnected upper and lower spans, said upper span carrying the articles thereon,

(c) an endless flexible alignment means disposed in side-by-side relation with said conveyor means and having interconnected upper and lower spans, said alignment means including a plurality of aligner elements disposed in spaced relation lengthwise of said alignment means and projecting above the upper span of the conveyor means

for engagement with the articles carried by said conveyor means,

(d) drive means for driving said conveyor means at a linear speed of greater than that of the alignment means whereby the articles carried by the conveyor means tend to be urged into engaging relation with the aligner elements,

(e) said drive means including means mounting the conveyor means and the alignment means to the support means, for travel of the upper spans thereof in a direction generally parallel with longitudinal axis of the support means, and

(f) the flexible conveyor means being a belt,

(g) the flexible alignment means being a chain having aligner elements attached to the links thereof, and

(h) the drive means including:

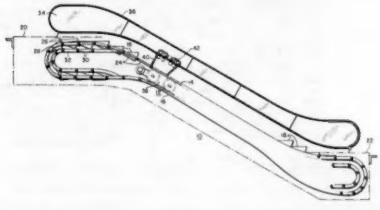
1. a first shaft carried by the support means and having an axis of rotation disposed transversely of the longitudinal axis of the support means, said shafts including a sprocket and pulley coaxially mounted thereon,
2. a second shaft carried by the support means, in spaced parallel relation to the first shaft and including a sprocket and pulley coaxially mounted thereon,
3. said sprockets on said first and second shafts carrying said chain and said pulleys on said first and second shafts carrying said belt, one of said sprockets being a drive sprocket the other of said sprockets being an idler sprocket free to rotate on its shaft and one of said pulleys being a drive pulley the other of said pulleys being an idler pulley free to rotate on its shaft, one of said shafts carrying said drive sprocket and said idler pulley and the other of said shafts carrying said idler sprocket and said drive pulley,
4. an independent drive member being fixedly attached to one of said shafts and an independent drive member having a different pitch circle diameter being fixedly attached to the other of said shafts and means operatively connecting said member rotating the first and second shafts at different speeds, and
5. said linear speed differential between said conveyor belt and said aligner chain being achieved at least in part by the difference between the pitch circle diameter of said independent drive and driven members.

4,257,515

TRANSPORTATION APPARATUS

Mohamed A. El Taher, Highland Township, Adams County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1977, Ser. No. 787,631
Int. Cl.³ B66B *9/12*
U.S. Cl. 198—333 **8 Claims**



1. A moving stairway extending between upper and lower landings, comprising:

an endless flexible unit,

drive means for driving said unit in a loop which includes an upper load bearing run and a lower return run,

a plurality of steps mounted on said unit for articulation between a step mode on the load bearing run and a platform mode adjacent each landing,

each of said steps having a tread part and a riser part,

and marker means on at least certain of said riser parts, said marker means on a riser part being exposed when the associated step is in step mode, and covered by an adjacent step during the transition of the step between said step mode and said platform mode,

said marker means being substantially closer to the tread part of an adjacent step than to the tread part of its associated step, when said steps are in step mode, such that said marker means disappear substantially at the start of step articulation for descending steps approaching the lower landing, and appear substantially at the end of articulation for ascending steps leaving the lower landing,

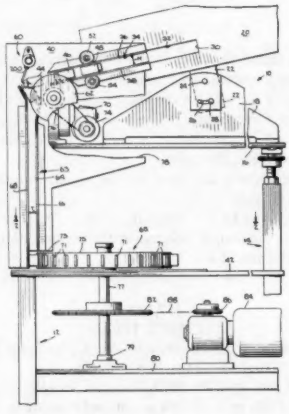
said marker means providing motion and direction markers responsive to step articulation for prospective passengers attempting to enter the stairway from the lower landing, with the motion and direction marker creating visually different "flashing" effects responsive to descending and ascending steps when viewed from the lower landing, as the marker means suddenly and sequentially disappear on descending steps, and suddenly and sequentially appear on ascending steps.

4,257,516

HIGH SPEED BOTTLE ORIENTING APPARATUS

Alexandru D. Ionescu, Bronx, N.Y., assignor to New England Machinery, Inc., South Norwalk, Conn.

Division of Ser. No. 763,906, Jan. 31, 1977. This application Dec. 20, 1978, Ser. No. 971,633
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—399 **1 Claim**



1. Bottle orienting apparatus comprising guide means for receiving and advancing in random open-end leading and open-end trailing dispositions bottles having one corresponding end portion which is enlarged relative to the other end portion thereof, discriminating means downstream of and cooperative with said guide means for distinguishing bottles of enlarged-end trailing disposition from bottles of enlarged-end leading disposition and altering the disposition of each of the enlarged-end trailing bottles to respective enlarged-end leading dispositions as said bottles move through said discriminating means, said discriminating means including bottle dragging means for applying an external frictional force to the enlarged-end portions of said bottles in said discriminating means, said force tending to rotate said bottles in said discriminating means about an axis passing through said bottles, said discriminating means including means for preventing rotation therein of bottles which are received therein in an enlarged-end leading disposition, said discriminating means further including gripping means for frictionally gripping opposite sides of said bottles upon their arrival at said discriminating means, said gripping means including a pair of coaxially spaced, flexible, disc-like elements and a drive means for rotating said disc-like

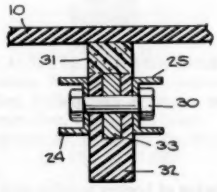
elements in unison in a prescribed direction, said bottle-dragging means being engageable with said bottles in succession at a location above the rotary axis of said disc-like elements and tending to rotate each of said bottles in a direction opposite to said prescribed direction in which said disc-like elements are rotated, said bottle dragging means including roller means having a periphery confronting radially the space between said disc-like elements and roller drive means for rotating said roller means at a peripheral speed that is less than the speed of rotation of the respective portions of said disc-like elements which grip said bottles in succession, said roller drive means including a drive pulley operatively associated with said roller means and an endless belt coupling said drive pulley and said roller means to one another, said guide means including a set of pulleys and a second endless belt coupling said set of pulleys to one another and arranged below and in spaced relation from said roller means and said endless belt associated with said roller means, said endless belt associated with said set of pulleys and said endless belt associated with said roller means being cooperative with one another to grip and advance said bottles in succession to said discriminating means, said bottle orienting apparatus further including take-off means positioned downstream of said discriminating means and cooperative therewith for removing from said discriminating means all of the bottles which pass therethrough.

4,257,517

SCRAPER BARS FOR USE WITH CONVEYOR BELTING AND THE LIKE

Edwin J. MacPherson, Elmira; Peter J. Alderson, Dollard-des-Ormeaux, and Douglas A. Skinner, Bellwood, all of Canada, assignors to Uniroyal Ltd., Don Mills, Canada

Filed Dec. 6, 1976, Ser. No. 748,259
Int. Cl.[3] B65G *45/00*
U.S. Cl. 198—497 **9 Claims**



1. An elongated scraper bar for use with conveyor belting and the like including a first layer formed from hard, abrasion resistant pellets embedded in elastomer to make an elastomer/-pellet matrix, a second layer of elastomer without such pellets, and an elongated insert of rigid material embedded in said second layer, said second layer in the absence of said insert having a tendency to shrink after demolding which is greater than the tendency of said pellet-containing first layer of elastomer to shrink after demolding, whereby said insert inhibits differential shrinkage-caused bowing and warpage of the scraper bar upon demolding.

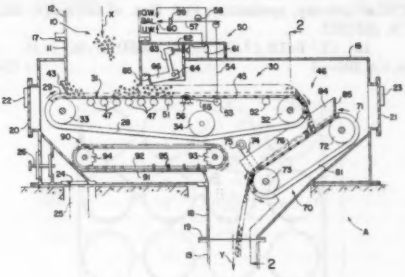
4,257,518

FEEDER FOR PARTICULATE MATERIAL

Arthur J. Stock, Lakewood, and Donald E. Christofer, Mentor, both of Ohio, assignors to Stock Equipment Company, Cleveland, Ohio

Filed Oct. 25, 1978, Ser. No. 954,353
Int. Cl.[3] B65G *37/00*; G01G *11/10*
U.S. Cl. 198—504 **6 Claims**

2. Apparatus for feeding particulate coal in a controlled feed rate comprising a housing, inlet opening means in said housing permitting entrance of particulate coal into said housing at a feed location, discharge opening means from said housing permitting downward discharge of particulate coal from said housing, laterally extending first conveyor means in said housing for laterally transporting particulate coal from said feed location to a first discharge location of said first conveyor means that is offset laterally from said discharge opening means in said housing in a direction away from said inlet opening means and said discharge opening means so that the lateral distance between said inlet opening means and said discharge opening means of said housing is substantially less than the lateral distance between said feed location and said first discharge location of said first conveyor means, feed control means operatively associated with said first conveyor means



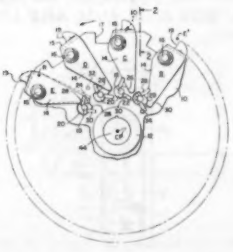
between its feed location and its first discharge location for controlling the amount of coal received by and discharged by said first conveyor means and the rate of discharge thereof, and second conveyor means below said first conveyor means for receiving coal discharge at said first discharge location from said first conveyor means and for transporting said coal in a direction generally downwardly inclined and opposite to the direction of travel of coal on said first conveyor means and for discharging it at a second discharge location into said discharge opening means of said housing at a controlled feed rate corresponding to the rate of discharge from said first conveyor means.

4,257,519

FRICTIONLESS ENTRY AND RELEASE SPROCKET

John M. Leach, Box 341, Port Jefferson, N.Y. 11777

Filed May 3, 1979, Ser. No. 35,715
Int. Cl.[3] B65G *23/06*; F16H *55/30*
U.S. Cl. 198—834 **8 Claims**



1. A machine, such as a conveyor, including a link chain, a sprocket for coaction with said chain and comprising a rotatable circular main plate, teeth for meshing with said chain and being positioned around the periphery of said main plate, each tooth being rotatably attached to said main plate and having an area thereon in position thereon for contact with a cam face so as to be rotated thereby, a cam-stop also rotatably mounted on said main plate adjacent to each tooth and having two cam face areas capable of selectively contacting said cam contacting

area on the adjacent tooth, and means for positioning each of said cam-stops so that a cam face will rotate its adjacent tooth into one position as the tooth engages the chain and so that the other cam face will enable said tooth to rotate into a different position as said tooth releases from said chain.

4,257,520

INTEGRAL AMMUNITION BUNKER

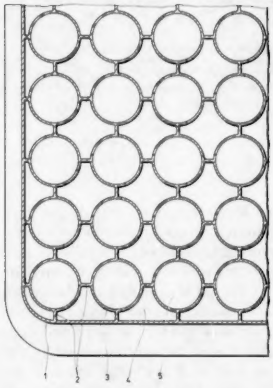
Claus Hohmann, Donauwörth, and Wolfgang Glück, Kissing, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Jul. 13, 1979, Ser. No. 57,432

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1978, 2832573

Int. Cl.[3] **F42B** *37/00, 39/00;* **B65D** *81/00, 1/36*

U.S. Cl. 206—3 **3 Claims**



1. An ammunition bunker comprising a plurality of individual tubular members each arranged adjacent each other and adapted to receive ammunition therein, and webs connecting all of said individual tubular members together, said bunker being essentially formed in its totality as an integral cast piece composed entirely of plastic material.

4,257,521

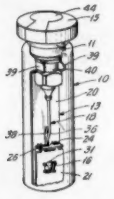
PACKAGING MEANS FOR AN INTRAOCULAR LENS

Stanley Poler, 78 E. Second St., New York, N.Y. 10003

Filed Nov. 16, 1979, Ser. No. 94,912

Int. Cl.[3] **B65D** *81/18, 41/58;* **A61F** *1/16, 1/18*

U.S. Cl. 206—5.1 **10 Claims**



1. Packaging means for a circular intraocular lens in assembled relation to retaining haptic which has effective circumferential engagement to both axial sides of the periphery of the lens and which also extends radially outside the lens periphery and which also has external locating-edge formations at a geometrical circle which is concentric with but larger than the periphery of the lens, said packaging means comprising a snap-retaining holder formed from a single piece of compliant autoclavable sheet material, said piece comprising an elongate generally rectangular lower panel integrally and bendably connected along a transverse fold axis at one end to a generally rectangular but less elongate upper panel, detachably engageable interlocking formatitons at the free end of said upper panel and at that lower panel region with which said free end registers when bent to overstand said lower panel, said panels having circular apertures which register when said panels are thus bent, a plurality of angularly spaced haptic-locating lugs struck up from the body of one of said panels at locations angularly spaced about the circular aperture of said one panel and extending in the direction of the other panel, the circular aperture of said other panel having radially outward lobe recesses at locations registering with the struck-up lug locations and sized to allow clear passage of said lugs when said panels are thus bent, said lugs being adapted to engage the locating-edge formations of the haptic of a lens assembly, and said panels having axial-end retaining contact with the lens assembly via the haptic thereof when said formations are detachably engaged.

4,257,522

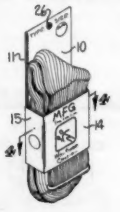
HOSIERY DISPLAY HANGER PACKAGE

James L. Thorneburg, P.O. Box 5440, Statesville, N.C. 28677

Filed Aug. 17, 1979, Ser. No. 67,346

Int. Cl.[3] **B65D** *85/18, 75/00*

U.S. Cl. 206—299 **7 Claims**



1. The combination of hosiery articles, such as socks, and a hanger package for supporting said hosiery articles for display on a merchandizing rack and comprising

(a) a hanger support including upper and lower ends with means associated with said upper end for supporting said package on the merchandizing rack, and

(b) a hosiery support band integrally formed with said hanger support for encircling and resiliently maintaining said hosiery articles in substantially a vertical position therein, said hosiery support band including

(1) a rear panel of substantially the same width as said hosiery articles and including an upper edge integral with the lower edge of said hanger support,

(2) a front panel of substantially the same width as said rear panel, and

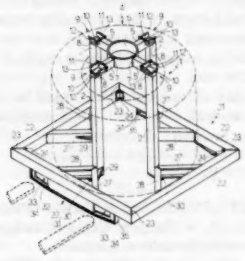
(3) a pair of side panels connecting opposed side edges of said front and rear panels to maintain said front and rear pannels in parallel spaced apart relationship, said side panels being of substantially the same thickness as said hosiery articles so that said support band encircles and resiliently engages a medial portion of said hosiery articles with the upper and lower end portions of said hosiery articles being visible above and below said support band, said front and rear panels being bowed outwardly when said side panels are depressed toward each other to facilitate insertion of said hosiery articles.

4,257,523

DEVICE FOR STORING, TRANSPORTING, LIFTING AND UTILIZING WIRE ROD

Pietro Biasio, Florence, Italy, assignor to Italrame S.p.A., Italy

Filed Apr. 27, 1979, Ser. No. 33,948
Claims priority, application Italy, Sep. 29, 1978, 69242 A/78
Int. Cl.[3] B65D *85/04, 19/29, 19/44*
U.S. Cl. 206—303 8 Claims



1. A device for storing, transporting and utilizing wire rod formed into a ring shaped wired rod coil, said device comprising:

a first frame around which said wire rod is formed into a coil, said first frame having an upper and lower end, said first frame having support means at its upper end for engaging and supporting the lower end of a further first frame whereby said first frames can be stacked upon each other,

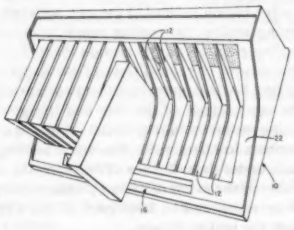
a second frame secured to and extending laterally outwardly from the lower end of said first frame, said second frame forming a platform which provides axial support for said wire rod coil.

4,257,524

CASSETTE STORAGE RACK

Edward H. Yonkers, Newton; Alan Stenfors, Scituate, and Gregory Mathus, Sudbury, all of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Filed Oct. 30, 1978, Ser. No. 956,050
Int. Cl.[3] A47F *7/00*
U.S. Cl. 211—71 8 Claims



1. A cassette storage rack comprising

a base member,

a plurality of dividing means secured to the base member for supporting boxes cassettes in a uniform array on it,

retaining means secured to the base member for engaging one edge of each cassette box on the rack,

and a resilient foam plastic block secured to the base member for engaging the edge of each cassette box in the rack opposite the edge engaging the retaining means for urging the cassette boxes against said retaining means to hold them in the rack,

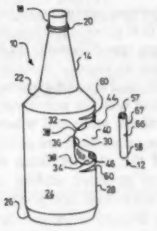
said top wall having a front edge spaced rearwardly of the retaining means and of a rear edge of the base member to define an open front and top area through which the cassettes are received, said open area permitting sufficient rotation of the cassette to engage, upon insertion, with the retaining means.

4,257,525

BOTTLE WITH ATTACHED HANDLE

Mortimer S. Thompson, P.O. Box 113, Enfield, Conn. 06082

Continuation-in-part of Ser. No. 28,886, Apr. 10, 1979, which is a continuation of Ser. No. 877,603, Feb. 14, 1978, abandoned. This application May 21, 1979, Ser. No. 40,864
Int. Cl.[3] B65D *23/10*
U.S. Cl. 215—100 A 35 Claims



1. A bottle having a neck finish at one end, a base at its other end and a sidewall therebetween, comprising:

a recess in said sidewall which forms a space for finger placement in said sidewall and within said recess, and,

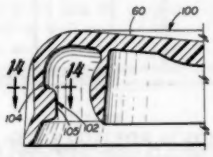
attachment means on said sidewall at said recess receiving a handle having attachment means thereon which coact with said recess attachment means to secure said handle to said bottle said handle extending essentially within and bridging said recess and about which finger placement can occur within said recess for lifting, carrying and pouring from the bottle by gripping said attached handle.

4,257,526

BOTTLE CLOSURE AND FINISH

Ferdinand Weits, Arvada; Ronald A. Pearce, Lakewood, and Norman G. Pennington, Arvada, all of Colo., assignors to Coors Container Company, Golden, Colo.

Filed Aug. 21, 1978, Ser. No. 935,738
Int. Cl.[3] B65D *41/06, 41/36*
U.S. Cl. 215—332 7 Claims



1. An improved beverage bottle finish and pressure sealing closure thereof, wherein the beverage bottle finish is of the kind having a cylindrical shape with an open mouth at the upper axial end thereof, and the closure is of the type having a circular base adapted to fit over the bottle mouth, a first depending skirt fitting around the exterior surface of the finish, and means for sealing pressure in the bottle, wherein the improvement comprises: said closure being of a synthetic resin material, having a plurality of circumferentially spaced, integrally formed, fingers on the radially inner surface of the first skirt, wherein said fingers are at substantially equal axial height

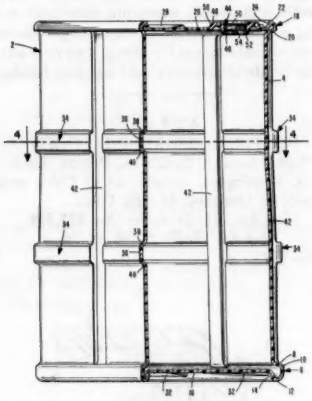
on the first skirt and are non-overlapping circumferentially, and wherein the pressure sealing means comprises a second skirt depending from the circular base inside the radius of the first skirt and having an outer pressure sealing face contacting said finish near the inner side of the open mouth; said finish having a like plurality of circumferentially evenly spaced indentations in the radially exterior surface thereof, each of said indentations comprising a bayonet groove having an upward opening near the plane of the bottle mouth, said finish further having a first groove portion spiraling circumferentially in a given first direction and downwardly from said opening at a first predetermined angle below the plane of the bottle mouth for guiding and retaining said fingers for movement out of the bayonet groove and through said opening during disengagement of the closure from the finish by twisting in a second and opposite direction; and the finish also having a second groove portion continuously connected to the lower end of said first groove portion and extending circumferentially and angling non-downwardly in the same direction for a sufficient distance to receive in excess of one-half of one of said fingers therein, said second groove portion having a terminal axially extending wall for preventing twisting of said finger past the position of the wall; and wherein said fingers, second skirt, and first groove portion are configured such that during disengagement of the closure from the finish said pressure sealing face ceases pressure sealing contact with the finish while said fingers are in said first groove portion and before the fingers are axially aligned with said opening.

4,257,527

PLASTIC DRUM

Larry L. Snyder, and LaVelle H. Hansen, both of Lincoln, Nebr., assignors to Snyder Industries, Inc., Lincoln, Nebr.

Filed Aug. 4, 1976, Ser. No. 711,562
Int. Cl.³ B65D *7/42, 7/02*
U.S. Cl. 220—72 **16 Claims**



1. A drum molded of cross-linked, high density polyethylene, said drum comprising:

(a) a body having a continuous substantially cylindrical wall of cross-linked polyethylene closed at its top and bottom ends, respectively, by top and bottom end pieces of cross-linked polyethylene molded and formed integrally with said continuous wall;

(b) an arcuate, hollow load bearing chime of cross-linked polyethylene integrally molded and formed with and connecting the top of said wall with said top end piece, said chime extending above the surface of said top end piece, and comprising a substantially arcuate outer wall, integral with and connected to the top of said continuous wall by a short outwardly flared section of said continuous wall, and an inner wall connected between said outer wall and said top surface, said chime being capable of being lifted and supported by parrot-beak type drum handling equipment;

(c) at least one rolling hoop formed integrally with said continuous wall and located in the body of said drum between said chime and said bottom end piece, said hoop extending circumferentially around said continuous wall and capable of being engaged by the forks of a forklift regardless of the orientation of said cylinder relative to the forklift, said hoop further extending outwardly from said continuous wall a sufficient distance to support a fully loaded drum when said hoop is engaged by the forks of the forklift; and

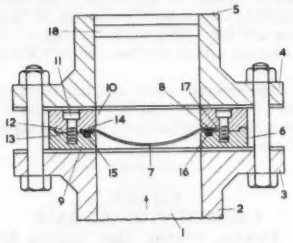
(d) a plurality of vertical ribs formed integrally with said continuous wall at spaced circumferential positions and extending inwardly therefrom.

4,257,528

SAFETY PRESSURE RELIEF APPARATUS

George W. Brodie, Wellington, England, assignor to IMI Marston Limited, Staffordshire, England

Continuation of Ser. No. 542,404, Jan. 20, 1975, abandoned. This application Apr. 10, 1978, Ser. No. 894,834
Claims priority, application United Kingdom, Feb. 6, 1974, 5389/74
Int. Cl.³ F16K *17/40*
U.S. Cl. 220—89 A **10 Claims**



1. A safety pressure relief device comprising a pair of annular support members fixed in contact with each other by clamping means and defining between portions of the members a gap of predetermined width, a reverse buckling disc having an annular edge region located in the gap, separate sealing and disc restraining means, the sealing means comprising a compressible sealing ring of O-cross section located in a groove in the gap-determining portion of one of the support members, said sealing ring being compressed to a predetermined amount between the edge region of the disc and the groove and the disc restraining means including abutment means on one of the support members to restrain the disc when tending to radially spread, in use, under the influence of pressure, the arrangement being such that in the event of excess pressure being applied to the disc, it reverses, and at least part of the edge region is released from the sealing means.

4,257,529

EASY-OPEN RETAINED TAB STRUCTURE FOR BEVERAGE CAN

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Apr. 12, 1979, Ser. No. 29,345
Int. Cl.³ B65D *41/32*
U.S. Cl. 220—269 **5 Claims**

1. Sheet metal container wall with easy-open, retained tab, pour-feature opening structure comprising

a sheet metal container wall panel,

linearly extended scoreline means in such wall panel with

residual metal of a thickness less than that of the sheet metal container wall panel,

such scoreline means outlining a movable wall portion to be moved out of conforming contour with the remainder of the sheet metal wall panel, such movable wall portion having an elongated configuration about a longitudinal axis to define an elongated pour-feature opening in such wall panel,

such scoreline means circumscribing a major portion of such elongated pour-feature opening with non-scored sheet metal between terminating ends of the linearly extended scoreline means comprising a hinge means for retaining the movable wall tab portion to the remainder of the panel wall upon opening of the container,

the linearly extended scoreline means including

a primary scoreline which is ruptured to form such elongated opening,

such primary scoreline penetrating the sheet metal container wall to provide predetermined thickness residual metal, and

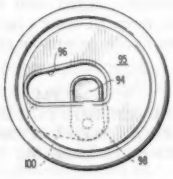
secondary scoreline means being adjacent the primary scoreline defining the elongated opening,

such secondary scoreline means being substantially uniformly spaced from the primary scoreline,

such secondary scoreline means penetrating the sheet metal to leave residual metal or substantially greater thickness than the residual metal of the primary scoreline,

such secondary scoreline means being substantially coextensive with the primary scoreline and comprising

a secondary scoreline located in the movable wall portion, and



a secondary scoreline in the remainder of the sheet metal wall panel,

an elongated tab opener having a working end and a handle end at its opposite longitudinal ends,

unitary rivet means for securing the tab opener to the movable wall tab portion contiguous to one longitudinal end of the movable wall portion, with the longitudinal axis of the tab opener in substantially right angled relationship to the longitudinal axis of the movable wall portion and with the working end of the tab opener contiguous to and aligned with a portion of the primary scoreline which is to be severed initially and the handle end of the tab opener being in overlaying relationship to the non-scored sheet metal between terminating ends of the linearly extended scoreline means which comprise such hinge means,

such secondary scoreline within the movable wall portion being spaced from the primary scoreline toward the unitary rivet means,

aperture means in the tab opener for receiving metal for forming the unitary rivet means,

such unitary rivet means including a rivet head means securing the tab opener to the movable tab portion,

the aperture for receiving such rivet head being located along the longitudinal axis of the elongated tab opener contiguous to the working end of the elongated tab opener so as to align the working end of the tab opener with such portion of the scoreline means which is to be severed initially,

such residual metal of the scoreline means being severed by Class 1 lever action by movement of the handle end of the tab opener through a 90° arc in a direction away from the container wall panel causing severance of the scoreline and moving the movable wall tab portion internally of the container into a plane substantially perpendicular to the remainder of the panel wall to provide such elongated opening with the movable wall tab portion being retained by the remainder of the wall panel and the tab opener being retained by the movable tab portion,

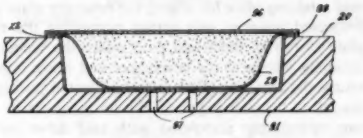
the tab opener being positioned to be substantially free of protrusions above the contour of the remainder of the sheet metal wall panel by rotation of the elongated tab opener about the unitary rivet means to a position within the container substantially parallel to the plane of the movable wall portion.

4,257,530

LINED TRAY

Rudolph A. Faller, Edina, Minn., assignor to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 928,357, Jul. 27, 1978, Pat. No. 4,200,481.
This application Jun. 27, 1979, Ser. No. 52,612
Int. Cl.³ B65D *5/58, 5/64*
U.S. Cl. 220—469 **2 Claims**



1. A lined carton comprising:

(a) a tray of substantially non-air permeable material having a polygonal bottom wall and integral side walls substantially perpendicularly disposed from said bottom wall and having outwardly bent flanges substantially perpendicularly disposed from said side walls;

(b) means forming a centrally disposed preselected area defined by a predetermined pattern of air permeability for allowing the withdrawal of air therethrough during manufacture of said lined carton; and

(c) a film liner having a polygonal bottom wall and outwardly extending side walls integrally connected to said bottom wall of said liner with the transition therebetween defined by rounded corners, the bottom wall of said liner being bonded to at least the preselected area of said bottom wall of said tray while being spaced from said tray at the sidewalls thereof and an area of the bottom wall of said tray adjacent each of its sidewalls, said liner having a peripheral flange outwardly extending from its sidewalls and bonded to the flanges of said tray, said corners being relatively more round than the transition corners formed between the bottom wall and side walls of said tray, the space between said tray and liner decreasing with an increase in height from the bottom wall of said tray.

4,257,531

DELIVERY APPARATUS FOR AUTOMATIC NEWSPAPER VENDING MACHINE

Yoshiaki Kimura, Osaka, and Terutada Nakazawa, Tenri, both of Japan, assignors to Kinki Sharyo Kabushiki Kaisha, Japan

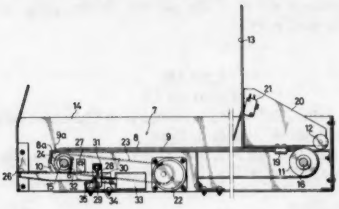
Filed Mar. 30, 1979, Ser. No. 25,590
Claims priority, application Japan, Mar. 1, 1979, 54/26397
Int. Cl.³ B65H *1/02*
U.S. Cl. 221—227 **5 Claims**

1. A delivery apparatus for an automatic newspaper vending machine comprising a support plate attached to the body of the machine in a position slanting downward from the front side of the machine toward the rear side thereof for delivering newspapers, a pair of belts arranged on opposite sides of the support plate for delivering newspapers, drive means including pulleys for driving the belts at a low speed in the direction of delivery

of newspapers and a newspaper outlet provided on the lower front side of the machine body, further comprising:

a retaining plate operatively mounted on said body retractable from a projected position in which it projects into a path along which a newspaper pushed off the delivery end of the support plate falls,

a solenoid mechanism mounted on said body and operatively associated with said retaining plate for releasably holding the retaining plate in its projected position,



a spring means operatively disposed between said body and said retaining plate for urging the retaining plate into said projected position, said spring permitting the retaining plate to retract from said path under the weight of the retaining plate and the newspaper and being operable to return the retaining plate to the projected position upon the fall of the newspaper off the retaining plate,

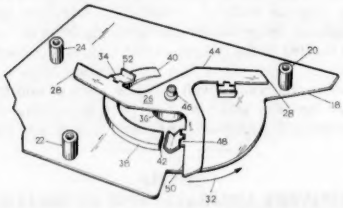
means operatively associated with said drive means for detecting said return of the retaining plate to start the drive means and for detecting the delivery of a newspaper onto the retaining plate to stope the drive means.

4,257,532

ROTARY CLOSURE DISPENSER

Christopher P. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 16, 1979, Ser. No. 66,910
Int. Cl.³ B65H *3/26*
U.S. Cl. 221—240 **8 Claims**



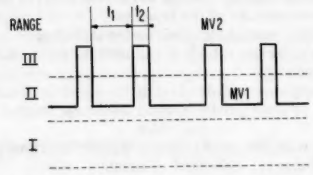
1. A dispenser for closures including an elongate hollow structure for storing a stacked array of closures, a first plate attached to one end of said elongate hollow structure, an aperture positioned between said structure and said first plate for the removal of closures from said structure, a second plate mounted in spaced apart relationship and parallel to said first plate, a crank mechanism positioned between said first and second plates, articulated members attached to said crank mechanism, a cam block for moving said articulated members one at a time into engagement with a closure whereby said closure is translated from said stacked array to a position outside of said hollow structure.

4,257,533

METHOD OF DISCHARGING SLURRY BY VARYING VALVE OPENINGS

Kiyoshi Matsuyama; Shozi Ishikawa; Seizi Hirata, and Tsutomu Ogura, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 16, 1979, Ser. No. 21,280
Claims priority, application Japan, Mar. 17, 1978, 53-31568
Int. Cl.³ B67B *7/00*
U.S. Cl. 222—1 **6 Claims**



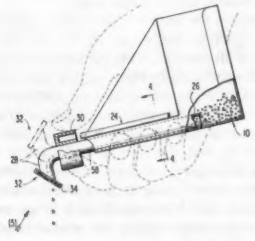
1. A method for discharging through a discharge valve a slurry containing polymer particles having an average particle diameter of 0.1 to 1 mm suspended therein, wherein the valve is so operated that the degree of the valve opening is set within a range II for a valve operating time t_1 and within a range III for a valve operating time t_2, and this operation is repeated periodically; the time t_1 being from 5 to 60 seconds, the time t_2 being from 1 to 10 seconds, the range II being a range at which the valve is gradually clogged with the polymer particles discharged and the range III being a range at which the valve permits continuous discharge without clogging.

4,257,534

APPARATUS AND METHOD FOR DISPENSING SEEDS FROM SEED PACKAGES

Gayland M. Williams, 11 Maple St., North Springfield, Vt. 05150

Filed Mar. 29, 1979, Ser. No. 25,159
Int. Cl.³ A01C *7/02*
U.S. Cl. 222—1 **4 Claims**



4. A method of dispensing small agricultural seeds from generally flat rectangular seed packages comprising:

(a) removing one corner of a seed package, creating an opening large enough to insert a tube while positioning the package so that seed therein will not flow out through the opening;

(b) inserting a straight portion of a seed tube having a straight portion and a bent end portion into the package through the opening and along one side of the package;

(c) folding down a corner of the seed package so that a part of the side of the seed package opposite the side with the tube is positioned adjacent the tube;

(d) applying a clip to hold the folded down corner of the package in place and cause the package portion around

the tube to journal the tube and the opening to be sealed around the tube;

(e) adjusting the size of an adjustable opening on the bent end of the tube;

(f) tilting the package so that seeds within the package position themselves in conjunction with tube rotation to flow into the straight portion of the tube and down the tube toward the bent portion of the tube, and

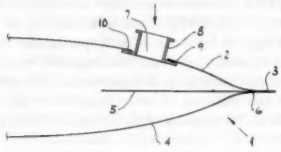
(g) rotating the tube to dispense seeds therefrom a few at a time.

4,257,535

CONTAINER FOR LIQUID HAVING A HEAT SEALABLE COLLAR FOR FILLING THE CONTAINER AND RECEIVING A DISPENSING MECHANISM

Lee T. Mellett, Glen Waverley, Australia, assignor to Wrightcel, Ltd., Auburn, Australia

Filed May 23, 1979, Ser. No. 41,731
Claims priority, application Australia, May 30, 1978, PD4550
Int. Cl.³ B67B *7/24*
U.S. Cl. 222—92 **2 Claims**



1. A flexible container, comprising:

(a) a wall having a heat sealable opening:

(b) a collar surrounding said heat sealable opening for filling said container before said opening is heat sealed and for receiving a dispensing means after said container is filled and said opening is heat sealed, and

(c) a flap internally disposed within said container over said opening for providing a fluid seal over said opening after said container is filled through said collar, said flap including:

(i) a first heat-sealable furface facing said opening for providing a fluid seal over said opening when heat is applied outside the container in the region of said flap; and,

(ii) a second non-heat-sealable surface facing away from said opening for preventing said flap from being heat sealed to the interior of said container when heat is applied outside the container in the region of said flap to heat seal said flap over said opening.

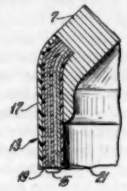
4,257,536

LAMINATE STRUCTURE FOR COLLAPSIBLE DISPENSING CONTAINER

Shaun K. Hilmar, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Oct. 15, 1979, Ser. No. 84,663
Int. Cl.³ B65D *35/08*; B32B *15/08, 27/08*
U.S. Cl. 222—107 **24 Claims**

1. A collapsible dispensing container having a tubular body and a thermoplastic head fused thereto, said tubular body having a plurality of laminations, including a sealant core film, a first overlying layer of ethylene-acrylic acid copolymer on the product side of said sealant core film, an outer overlying thermoplastic polymer layer and a second layer of ethylene-acrylic acid copolymer for adhesively bonding the outer side of said sealant core film to said outer thermoplastic polymer layer; said sealant core film comprising a metallic foil layer secured to said second ethylene-acrylic acid copolymer layer, an intermediate polyester barrier layer bonded to said metal foil layer by a first adhesive layer and a heat sealable polymer



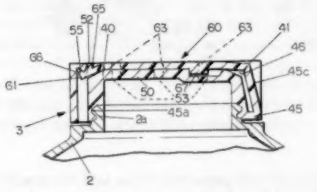
layer bonded to the other surface of said barrier layer by a second adhesive layer.

4,257,537

CHILD RESISTANT SIFTER TYPE CLOSURE

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 44,871, Jun. 1, 1979. This application Aug. 20, 1979, Ser. No. 67,965
Int. Cl.³ B67B *5/00*
U.S. Cl. 222—153 **9 Claims**



1. A sifter fitment and closure for a container neck comprising an inverted cup-shaped body formed of resilient plastic material and having a generally circular top panel portion and an integral annular side wall, means on said side wall for detachably securing the fitment to a container neck, a locking flap connected to a peripheral portion of said panel by an integral hinge and being foldable into an overlying position relative to said panel, a set of co-operating locking surfaces on said locking flap and said panel for securing said locking flap in said overlying position, but permitting linear movement of said locking flap relative to said panel in the direction of its longitudinal axis, that portion of the annular side wall underlying said integral hinge being inwardly depressible whereby said wall portion may be inwardly depressed by compressing action exerted by the fingers to shift said locking flap longitudinally, and at least one dispensing opening formed in said panel beneath said locking flap and communicating with the interior of the container, said locking flap having an aperture therethrough which is aligned with said dispensing opening only when said locking flap is shifted longitudinally by depressing of said outer wall segment.

4,257,538

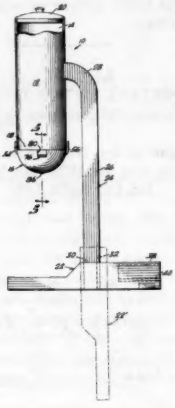
LIQUID DISPENSER

John H. Fowler, 5961 Prather Dr., Fort Myers, Fla. 33907

Filed Nov. 8, 1978, Ser. No. 958,734
Int. Cl.³ B67D *5/06*; G01F *11/28*
U.S. Cl. 222—181 **4 Claims**

1. A liquid dispenser comprising a container including an inner chamber for the reception of a quantity of a liquid to be dispensed and having an open upper end with a removable lid, a base for supporting said container, a support post connecting between said base and container with a bottom end of said container positioned a predetermined distance above said base,

a dose cup positioned beneath said bottom end, means to removably fix said dose cup relative to said bottom end, a double acting valve means, spring loaded to a normal first position and including means to move said valve means to a second position, a first discharge port in a bottom portion of said dose cup normally closed by said valve means in said first position, a second discharge port, spaced above said first discharge port, in a bottom end of said container and positioned a predetermined distance downwardly within a chamber defined in said dose cup said second port normally being open to permit a charge of liquid from said container to flow into said dose cup to a depth determined by a spaced position of said second discharge port above said dose cup bottom portion, said means to move being operable by a top edge of a receptacle, such as



one of a glass and paper cup when said receptacle is positioned beneath said first discharge port and is pressed upwardly opening said valve means relative to said first discharge port to cause the charge of liquid in said dose cup to flow into said receptacle and to simultaneously close said second discharge port until the receptacle is removed whereupon said valve means returns to a normal closed relation with said first discharge port and to an open relation with said second discharge port to recharge said dose cup from said container, said double acting valve comprising a release bar including a drop center portion spanning said dose cup chamber, and lower and upper valve members fixed to said drop center portion in axial alignment respectively with said first and second ports for alternate movement into and out of closing engagement therewith.

4,257,539

UNIVERSAL BODY VARIABLE SHROUD DISPENSER

John R. Cary; Theodore J. Humphrey, II, both of Miami Lakes, and Walter H. Wesner, Plantation, all of Fla., assignors to The APA Corporation, Miami Lakes, Fla.

Continuation of Ser. No. 881,998, Feb. 28, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,465

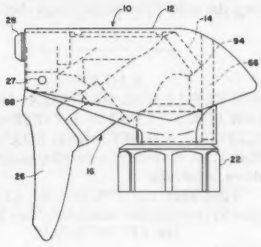
Int. Cl.³ B67D *5/06*

U.S. Cl. 222—182 **7 Claims**

1. A manufacture of fluid handling devices having a variety of different external surface features comprising,

a universal fluid handling component retaining body means including inlet means, trigger actuated pump chamber means, and outlet means, and

a flexible thin shell shroud for enclosing said body means, said shroud being a selected one of a variety of shrouds made separately from said body means, said variety of shrouds being characterized by their common projecting internal surface means positioned to provide, in cooperation with said thin shell shroud, snap action engagement with predetermined selected portions of said body means upon placement thereof in cooperative enclosing relation with respect to said body means, and being further characterized by their different external surface features, wherein said inlet means, trigger actuated pump chamber means, and outlet means are each substantially enclosed on all sides except the bottom thereof by said shroud, wherein said common internal surface means of said variety of shrouds includes a plurality of spaced elements,



wherein a selected portion of said body means includes an elongated cylindrical member associated with said outlet means, said cylindrical member having an elongated surface ridge, at least one of said spaced plurality of elements engaging said ridge, and wherein said one of said plurality of spaced elements is elongated and said elongated surface ridge and said one of said elements are in engagement for a substantial portion of the length of said ridge.

4,257,540

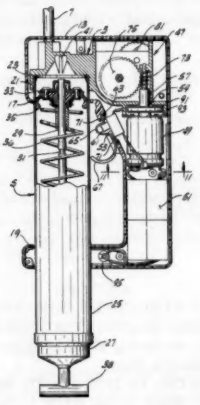
HAND-HELD BATTERY-POWERED GREASE GUN

Jerome B. Wegmann, St. Louis County, and Norbert F. Cook, Florissant, both of Mo., assignors to McNeil Corporation, Akron, Ohio

Filed Oct. 26, 1978, Ser. No. 954,976

Int. Cl.³ B67D *5/40*

U.S. Cl. 222—262 **3 Claims**



1. A hand-held battery-powered dispenser for lubricant or other pumpable material such as lubricating grease, comprising:

a barrel holding a supply of said material;

a head at one end of the barrel extending laterally from the barrel having a bore therein constituting a pump cylinder extending laterally with respect to the barrel;

a plunger slidable in the bore;

the head having an inlet intersecting the bore in communication with the barrel for the flow of said material from the

barrel to the bore and an outlet for the bore spaced from the inlet toward one end of the bore;

the plunger being slidable in the bore across the inlet toward said one end of the bore through a pumping stroke for pumping said material under pressure out through the outlet, and away from said one end of the bore through a return stroke for priming the bore;

means forming a handle, the handle being tubular and extending from the head alongside the barrel, the axis of the handle being generally parallel to that of the barrel, the handle being so sized and spaced from the barrel as to enable a user to grasp and hold the dispenser in one hand by the handle with the hand of the user substantially surrounding the handle and with the fingers of the user extending into the space between the handle and the barrel;

an electric motor in the handle at the end thereof toward the head, said motor having an output shaft, the axis of the shaft extending generally parallel to the axis of the handle;

a battery means received within the handle at the end thereof away from the head for energizing the motor, a circuit interconnecting the battery means and the motor including a switch operable by a user holding the dispenser in his hand by the handle for starting and stopping the motor;

drive means in the head operable by the motor for reciprocating the plunger comprising gear means rotatably mounted in the head and means interconnected with the gear means and the plunger for reciprocating the plunger longitudinally within the bore;

and a flywheel on said shaft for storing energy developed during each return stroke and releasing the stored energy to assist in moving the plunger during each pressure stroke, said shaft extending from the motor into the head and interconnected with the drive means;

the means for reciprocating the plunger comprising a rotary member in the head having a crank pin thereof, and a crank follower having an opening therein receiving the crank pin, said follower being reciprocated by the crank pin upon rotation of the rotary member for reciprocation of the plunger longitudinally within the bore;

the gear means comprising a worm on said motor shaft, a gear shaft, and a gear on said gear shaft, said crank pin being on the gear, said crank follower having a slot receiving the gear shaft for preventing transverse movement of the crank follower.

4,257,541

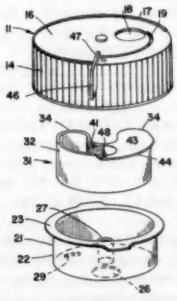
DISPENSING DEVICE FOR GRANULAR MATERIAL

David W. Souza, Fremont, Calif., assignor to S J Marketing, Inc., Palo Alto, Calif.

Filed Sep. 4, 1979, Ser. No. 71,885

Int. Cl.³ G01F *11/24*

U.S. Cl. 222—362 **3 Claims**



1. A dispensing device for use with a container having an opening, comprising; a cap member adapted to be secured to said container in abutting, sealing relationship to said opening, said cap member including an end wall having a discharge port therethrough; a generally cup-like housing secured to the inner surface of said cap member and having an open upper end joined to said inner surface of said wall, said housing being disposed entirely within said container; an intake port extending through the bottom end panel of said housing and non-aligned with respect to said discharge port; a dispensing member disposed within said housing and rotatably supported therein, said dispensing member including a continuous curved side wall having a first cylindrical portion spaced slightly inwardly of said housing and a second curved portion disposed concentrically within said first portion and joined thereto end-to-end to define a two lobed, kidney shaped structure; a dispensing chamber open at upper and lower ends and disposed medially of said two lobes and between said first and second portions of said side wall; a first lateral panel secured to the lower edge of one of said lobes; a second lateral panel secured to the upper edge of the other lobe; means for rotating said dispensing member from a first position in which said chamber is aligned with said intake port and said second lateral panel occludes said discharge port to a second position in which said chamber is aligned with said discharge port and said first lateral panel occludes said intake port, said last mentioned means including an arcuate slot extending through said end wall of said cap member, an arm extending through said slot and secured to said upper edge of said side wall, and a tabular member extending from the distal end of said arm and disposed radially outwardly of said cap member; first stop means associated with said arm for limiting rotation of said dispensing member, and second stop means associated with said bottom panel for limiting rotation of said dispensing member.

4,257,542

SLIDE GATE FOR CONTAINERS HOLDING LIQUID METAL MELT

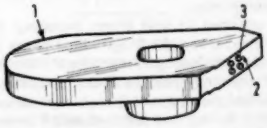
Walther Aller, Vielbach; Eckehard Eisermann, Grefrath; Dieter Vahlhaus, Mulheim an der Ruhr, and Gerd König, Neukirchen-Vluyn, all of Fed. Rep. of Germany, assignors to Martin & Pagenstecher GmbH, Cologne-Mülheim, Fed. Rep. of Germany

Filed Mar. 1, 1978, Ser. No. 882,487

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 2709462

Int. Cl.³ B22D *41/08, 45/00*

U.S. Cl. 222—600 **6 Claims**



1. In a slide gate for a container for holding molten metal comprising a slide housing and refractory bodies made of a refractory composition which refractory bodies have been impregnated with a carbon-containing medium, the improvement wherein said refractory body is impregnated with an impregnant consisting essentially of oil which oil is a carbon-containing medium and contains less than 10% by weight pitch.

4,257,543

THREE-PLATE SLIDE VALVE CLOSURE FOR LIQUID MELT CONTAINERS

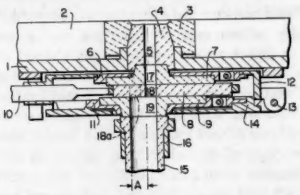
Udo Muschner, Tönisvorst, Fed. Rep. of Germany, and Emil Schnurrenberger, Steinhausen, Switzerland, assignors to Stopinc Aktiengesellschaft, Zug, Switzerland

Filed Aug. 13, 1979, Ser. No. 66,463

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1978, 2836434

Int. Cl.³ B22D *41/08*

U.S. Cl. 222—600 **7 Claims**



1. In a three-plate slide valve closure for liquid melt containers such as steel ladles, said closure being of the type including an upper stationary apertured refractory plate adapted to be fixedly positioned beneath an outlet in a liquid melt container, a lower stationary apertured refractory plate adapted to be fixedly positioned at a location spaced from said upper stationary plate, an apertured refractory slide plate mounted between said upper and lower stationary plates for sliding movement between open and closed positions, and said upper stationary plate, said slide plate and said lower stationary plate having extending therethrough first, second and third flow-through openings, respectively, which are aligned when said slide plate is in said open position, the improvement wherein:

at least an inlet portion of said third flow-through opening, adjacent said slide plate, has a dimension in the direction of movement of said slide plate at least twice as great as the dimension of an outlet end of said second flow-through opening in said direction, such that said outlet end of said second flow-through opening is constantly in communication with said third flow-through opening during movement of said slide plate between said open and closed positions, and no portion of an upper inlet edge of said third flow-through opening is ever positioned inwardly of any portion of a lower outlet edge of said second flow-through opening at all positions of said slide plate.

4,257,544

DETACHABLE MOTORCYCLE RACK

Barry Dierkes, 3962 Cedar, Long Beach, Calif. 90807

Filed May 9, 1979, Ser. No. 37,430

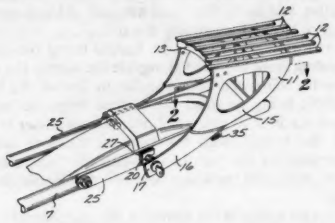
Int. Cl.³ B62J *7/04*

U.S. Cl. 224—32 A **2 Claims**

1. In a motorcycle having a seat supported by a frame the improvement comprising:

a subframe attached to said frame including longitudinal straps mounted along the longitudinal edges of said seat each such strap including a longitudinal slot terminating in a circular opening, said subframe includes mounting means attached thereto; and

a rack assembly having two opposed side frames combining to form a U-shaped structure together with a rack, said U-shaped structure being conformed to receive in supporting relationship said subframe on the interior thereof, each said side frame including a key assembly proximate the end thereof connected to rotate a pin having a smaller sectional dimension adapted to pass through said slot and a larger dimension conformed for receipt in said opening, said key assemblies being aligned to direct said pins towards each other, said rack assembly includes attachment means adapted to engage said mounting means during the course of translation of said pin along said slot, whereby said rack assembly may be slid onto said subframe and in the course of the sliding translation said pins engage said slots and said mounting means engage said attachment means.



4,257,545

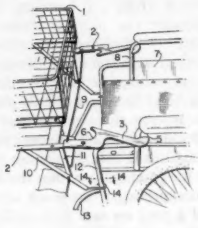
SHOPPING BASKET FOR A WHEELCHAIR

William C. Rhyan, Ft. Lauderdale, Fla., assignor to Clarke Carrier Corporation, Ft. Lauderdale, Fla.

Filed Apr. 30, 1979, Ser. No. 34,729

Int. Cl.³ B60R *9/00*

U.S. Cl. 224—42.43 **6 Claims**



1. A shopping basket for use with a wheelchair which comprises:

a basket means adapted to contain shopping items;

locking arm means operatively attached to the basket means to provide locking engagement with the wheelchair said locking arm means including opposing, spring-biased, engaging members extending from one end of the basket means;

hand release means attached to the locking arm means, the operation of the hand release means functioning to act against the spring bias of the locking arm means for releasing said locking engagement with the wheelchair; and

support means operatively attached to the basket means for engagement with the wheelchair to provide support in substantially the vertical direction.

4,257,546

TOOL FOR CLEAVING OPTICAL FIBERS

John E. Benasutti, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.

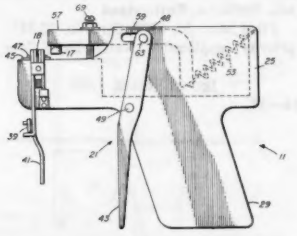
Filed Aug. 8, 1979, Ser. No. 64,669

Int. Cl.³ C03B *33/06*

U.S. Cl. 225—96.5 **4 Claims**

1. A hand held tool for cleaving optical fibers comprising an elongated tool body having a longitudinal axis extending lengthwise thereof, means for supporting and tensioning an optical fiber along an axis transverse to the longitudinal axis, said fiber supporting and tensioning means includes a backing member, a pair of clamps, means for biasing said clamps away

from each other so as to hold the fiber in tension, each clamp being positioned on either side of said backing member for holding a fiber in axial alignment in contact with said backing member, a lever pivotably mounted to said tool body with an end portion thereof adapted for hand actuation, means for severing an optical fiber including a cutting element, said severing means includes an elongated member pivotably



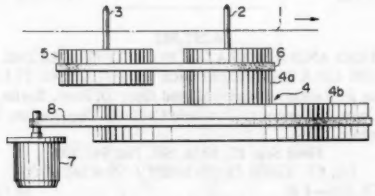
mounted at intermediate position to the other end of said lever, said cutting element being mounted at one end of said elongated member, said severing means further including meams operably associated with said elongated member and adapted to bias said cutting element toward an optical fiber to be cleaved, and means for guiding said cutting element in a direction toward and across the axis of an optical fiber when said lever is actuated for cleaving optical fibers.

4,257,547

TAPE TRANSPORT MECHANISM

Nobuhiro Hirabayashi, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corp., Nagoya, Japan

Continuation-in-part of Ser. No. 791,799, Apr. 28, 1977, abandoned, which is a continuation of Ser. No. 668,737, Mar. 19, 1976, abandoned. This application Feb. 2, 1979, Ser. No. 8,967
Claims priority, application Japan, Oct. 22, 1975, 50/144011
Int. Cl.³ B65H *17/42*
U.S. Cl. 226—110 **2 Claims**



1. A tape transport mechanism for tape recorders of the type including a first capstan for transporting a magnetic tape and a second capstan for imparting a predetermined tension to said magnetic tape, comprising:

(a) a first flywheel consisting of a smaller-diameter portion on which said first capstan is provided substantially coaxially therewith, and a larger-diameter portion which is integrally provided on said smaller-diameter portion substantially coaxially therewith at the side opposite to said first capstan;

(b) a second flywheel on which said second capstan is provided substantially coaxially therewith and in predetermined spaced parallel relationship with said first capstan, the upper surface of said larger-diameter portion of said first flywheel having such a radius as to extend in at least partially facing relationship with the lower surface of said second flywheel; said larger-diameter portion of said first flywheel being substantially greater than that of said second flywheel and of substantially greater mass with respect thereto;

(c) a rotary drive source having a rotary shaft extending in substantially parallel relationship with the axis of said larger-diameter portion;

(d) a first drive belt entrained around the rotary shaft of said rotary drive source and the larger-diameter portion of said first flywheel; and

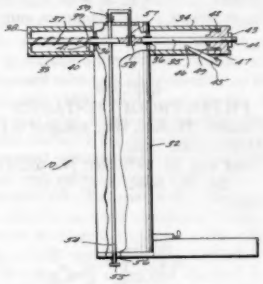
(e) a second drive belt entrained around said smaller-diameter portion of said first flywheel and said second flywheel.

4,257,548

FASTENING USING AIR HAMMER

James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Continuation-in-part of Ser. No. 873,969, Jan. 31, 1978, Pat. No. 4,184,357, which is a continuation-in-part of Ser. No. 833,338, Sep. 14, 1977, Pat. No. 4,183,239. This application May 18, 1979, Ser. No. 40,310
Int. Cl.³ B25C *7/00*
U.S. Cl. 227—8 **18 Claims**



1. A powered impacting device comprising:

a handle elongated in a direction of elongation; a first, inner piston; a second, outer, piston concentric with said first piston; means for receipt of a two-piece fastener, having concentric inner and outer components, in operative relationship with said pistons so that said outer component is driven by said second piston, and said inner component is driven by said first piston; and means for supplying actuating fluid to said pistons so that said second piston contacts said outer component and drives it axially in a given direction, and then said first piston contacts said inner component and drives it axially in the same direction, moving relative to said second piston, wherein the improvement comprises

a handle safety mechanism for preventing supply of actuating fluid to said pistons unless said handle safety mechanism is positively rotated about an axis parallel to said handle direction of elongation against spring pressure provided by spring means.

4,257,549

METHOD OF MAKING ALUMINUM-BASE METAL CLAD GALVANIZED STEEL LAMINATE

Robert J. Bricmont, Allison Park, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Division of Ser. No. 886,551, Mar. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,471, Apr. 25, 1977, abandoned. This application May 2, 1979, Ser. No. 35,210
Int. Cl.³ B32B *15/20*
U.S. Cl. 228—235 **5 Claims**

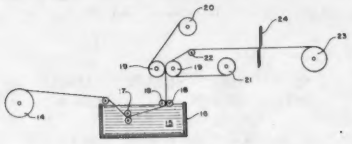
1. A method of producing an aluminum-base metal coated galvanized steel sheet comprising:

(a) applying a molten coating of zinc-rich metal to a rolled strip steel sheet to form a zinc-iron intermetallic alloy

layer between the said steel sheet and the said molten coating;

(b) while the said zinc-rich metal coating remains molten, applying a preformed foil of aluminum-base metal containing at least 65% by weight aluminum over at least one entire surface of the coated steel sheet;

(c) coincidently pressing the said foil toward the said steel sheet and chilling the said zinc-rich metal coating; and



(d) recovering a laminated steel sheet consisting of the said steel core; a zinc-rich metal coating over both surfaces of the said steel sheet; a zinc-iron intermetallic alloy layer between the said steel sheet and the said zinc-rich metal coating; and the said foil of aluminum-base metal being metallurgically adhered to at least one zinc-rich metal surface by means of a zinc-aluminum eutectic composition.

4,257,550

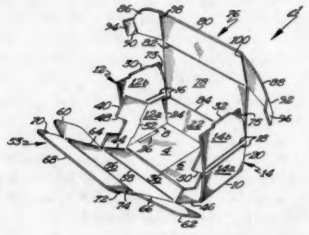
PILFER-PROOF CONTAINER

Stephen G. Frohlicher, Hudson, Wis., assignor to Liberty Carton Company, Minneapolis, Minn.

Filed Aug. 24, 1979, Ser. No. 69,342

Int. Cl.[3] B65D *5/30, 45/00*

U.S. Cl. 229—36 **7 Claims**



1. A pilfer proof container formed from a single blank of cut and scored fiberboard comprising:

a bottom wall;

a pair of front and rear walls hingedly attached to said bottom wall along fold line connections with the opposite, longitudinal edges thereof;

a pair of opposed end walls cooperating with said front and rear walls to form a substantially rectangular container;

a top wall inner panel hingedly attached to the top, longitudinal edge of said front wall and folded inwardly over the top of said container;

a rear wall reinforcing panel hingedly connected to the inner, longitudinal edge of said top wall inner panel and folded down inside of said container in overlapping relation to said rear wall to form a double wall thickness therewith;

detent means restrainably securing said top wall inner panel inside of said container at an inaccessible location therein;

a top wall outer closure panel hingedly connected along a fold line to the top edge of said rear wall and folded to a closed position overlying said top wall inner panel;

locking means on opposite ends of said top wall outer closure panel; and

complimentary retention means on each of said end walls within which said locking means of said top wall outer closure panel are held in locking engagement at an inaccessible location inside of said container.

4,257,551

APPARATUS FOR PREPARING AND PROCESSING RECEIPTS FOR CUSTOMERS OF PARKING LOTS OR THE LIKE

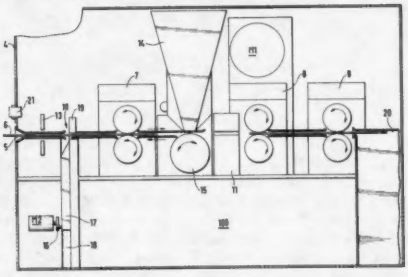
Hans Buchmann, Oetwil, Switzerland, assignor to Zühlke Engineering AG, Schlieren, Switzerland

Filed Mar. 20, 1979, Ser. No. 22,317

Claims priority, application Switzerland, Mar. 21, 1978, 3063/78

Int. Cl.[3] G06K *1/08*

U.S. Cl. 234—38 **12 Claims**



1. Apparatus for converting a sheet-like carrier of encoded information into two receipts, comprising transporting means defining a predetermined path for the carrier; signal generating means for decoding the information on the carrier in said path; means for processing the signals which are generated by said decoding means; means for applying to at least one portion of the carrier legible second information on the basis of processed signals; and means for separating said one portion of the carrier in said path from the remaining portion so that each of said portions constitutes a discrete receipt and at least one of said receipts bears the entire legible second information.

4,257,552

METHOD AND APPARATUS FOR CONTROLLING THE FLOW OF A TEMPERATURE REGULATING FLUID

Thomas P. Farkas, Bloomfield, and Gary D. Burr, Berlin, both of Conn., assignors to Dynamic Controls Corporation, South Windsor, Conn.

Filed Sep. 17, 1978, Ser. No. 943,300

Int. Cl.[3] G05D *23/00;* **H02B** *1/00;* **F24F** *7/00*

U.S. Cl. 236—1 R **16 Claims**

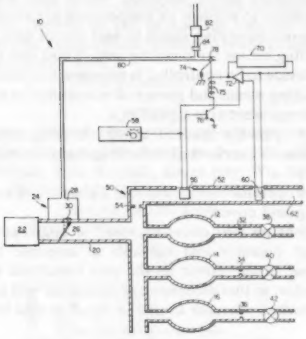
1. Apparatus for controlling the flow of a temperature regulating fluid through a supply conduit to a thermal load comprising:

flow modulating means connected with the supply conduit and being adjustable to modulate the flow of temperature regulating fluid through the supply conduit to the thermal load;

thermal load simulation means having a sampling conduit including a heat exchanging means connected with the supply conduit between the flow modulating means and the thermal load for sampling the temperature regulating fluid and for exchanging heat with a sampled portion of the fluid transmitted through the conduit and thereby affecting the temperature of the sampled fluid, the conduit having an upstream end connected with the supply conduit and a downstream end from which the sampled fluid is discharged, the heat exchanging means being located in the conduit between the upstream and downstream ends;

temperature sensing means positioned in the sampling con-

duit between the heat exchanging means and the discharge of the conduit at the downstream end for monitoring the downstream temperature of the sampled fluid affected by the thermal load simulating means downward of the connection with supply conduit and the heat exchanging means and providing a control signal representative of the downstream temperature and thermal effect of the fluid; and



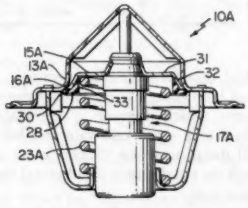
control means connected with the flow modulating means and responsive to the control signal from the temperature sensing means for modulating the flow of the temperature regulating fluid to the thermal load in accordance with the downstream temperature of the sampled fluid and the thermal effect of the regulating fluid.

4,257,553

VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Boyd P. Sliger, Concord, and Everett T. Steele, Jr., Knoxville, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 20, 1978, Ser. No. 890,606
Int. Cl.³ G05D *23/12*
U.S. Cl. 236—34.5 **12 Claims**



1. In a valve construction having a valve seat and a movable valve member for opening and closing said valve seat and being operatively interconnected to a thermal power element carried by said valve construction, said valve member having an annular metallic part for engaging said valve seat to close the same and having an annular flexible elastomeric part for also engaging said valve seat upstream from said metallic part to augment said closing of said valve seat, the improvement wherein said annular flexible elastomeric part is molded to said metallic part to be carried thereby, said annular metallic part of said valve member including a flat thin washer-like outer peripheral portion disposed substantially transverse to the direction of movement of said valve member and having opposed flat substantially parallel sides, said annular flexible elastomeric part also including a flat thin washer-like outer peripheral portion disposed substantially transverse to the direction of movement of said valve member and having opposed flat substantially parallel sides that extend radially beyond said flat portion of said metallic part and immediately adjacent thereto, said valve member comprising a cup-shaped metallic member having a closed end and an open end, said annular metallic part defining said open end thereof, said cup-shaped metallic member having an annular side wall interconnecting said closed end with said annular metallic part, said annular flexible elastomeric part also being molded to said annular side wall of said cup-shaped metallic member, and a compression spring being carried by said valve construction and having one end bearing against said closed end of said cup-shaped metallic member to tend to close said valve member against said valve seat, said compression spring being disposed inboard of said annular flexible elastomeric part.

7. In a method of making a valve construction having a valve seat and a movable valve member for opening and closing said valve seat and being operatively interconnected to a thermal power element carried by said valve construction, said valve member having an annular metallic part for engaging said valve seat to close the same and having an annular flexible elastomeric part for also engaging said valve seat upstream from said metallic part of augment said closing of said valve seat, the improvement comprising the steps of molding said annular flexible elastomeric part to said metallic part to be carried thereby, forming said annular metallic part of said valve member to include a flat thin washer-like outer peripheral portion disposed substantially transverse to the direction of movement of said valve member and having opposed flat substantially parallel sides, forming said annular flexible elastomeric part to also include a flat thin washer-like outer peripheral portion disposed substantially transverse to the direction of movement of said valve member and having opposed flat substantially parallel sides that extend radially beyond said flat portion of said metallic part and immediately adjacent thereto, forming said valve member to comprise a cup-shaped metallic member having a closed end and an open end with said annular metallic part defining said open end thereof, forming said cup-shaped metallic member to have an annular side wall interconnecting said closed end with said annular metallic part, also molding said annular flexible elastomeric part to said annular side wall of said cup-shaped metallic member, providing a compression spring to be carried by said valve construction and have one end bearing against said closed end of said cup-shaped metallic member to tend to close said valve member against said valve seat, and disposing said compression spring inboard of said annular flexible elastomeric part.

4,257,554

FAN ASSEMBLY

Rainer O. Willingham, Tacoma, Wash., assignor to Flex-A-Lite Products Corporation, Tacoma, Wash.

Filed Nov. 20, 1978, Ser. No. 962,136
Int. Cl.³ F01P *7/02*
U.S. Cl. 236—35 **6 Claims**

1. A fan assembly comprising:

a. a motor having a rotating shaft;

b. a fan having a first means for attaching said fan to said shaft;

c. a second means for mounting said motor and said fan on a heat exchanger;

d. said heat exchanger comprising a combination of tubes and fins, operatively, connecting with each other;

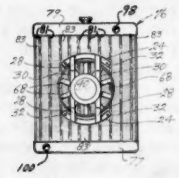
e. said second means, operatively, connecting with and mounted on said combination of tubes and fins so that the combination supports said second means;

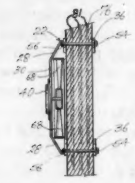
f. a third means in response to temperature for controlling the operation of the motor and the rotating shaft and the fan;

g. said second means comprising a mounting bracket;

h. a means for securing said mounting bracket to the combination of tubes and fins of said heat exchanger associated with a source of fluid;

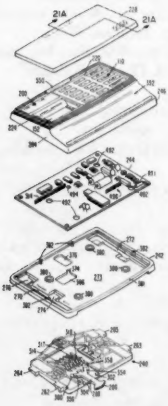
i. a means for allowing fluid to flow between said heat exchanger and said source of fluid;
j. said motor being an electric motor;
k. said third means, in response to the temperature of said fluid, controlling the operation of said motor sand fan;
l. said motor connecting with a source of electricity;
m. said mounting bracket comprising an integral support unit and mounting pads;
n. said integral support unit comprising two spaced apart bases;





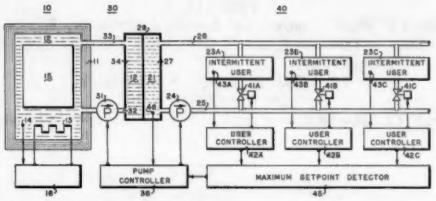
o. said two spaced apart bases and said mounting pads co-fitting with each other with said integral support unit on one side of said heat exchanger and said mounting pads on the other side of said heat exchanger;
p. means connecting said bases and said mounting pads to attach said mounting bracket to said radiator; and
q. means for attaching and mounting said motor on said integral support unit.

4,257,555
THERMOSTAT ASSEMBLY
Robert M. Neel, Ft. Collins, Colo., assignor to Teledyne Industries, Inc., Ft. Collins, Colo.
Division of Ser. No. 70,220, Aug. 27, 1979. This application May 6, 1980, Ser. No. 147,237
Int. Cl.[3] H01H *9/02;* **G06C** *7/02*
U.S. Cl. 236—94 **8 Claims**



1. A thermostat assembly comprising:
a housing assembly;
a plurality of switches mounted on said assembly for selective operation by the user;
an indicator mounted on said assembly for signaling to the user;
a circuit unit mounted within said assembly and interconnected to receive signals from said switching means and to deliver signals to said indicator;
a temperature sensor mounted within said assembly and responsive to ambient air temperature to deliver a temperature-representative signal to said circuit unit;
connecting means for coupling said circuit unit to an external device to be controlled in response to operation of said switching means and governed in response to said temperature-representative signal;
a cover openably secured to said housing assembly in a position to overlie said switching assembly and said indicator;
a switch operator included in said a plurality of switches and facing said cover;
and means on said cover disposed in alignment over said switch operator and movable in response to pressure applied to said cover by the user to actuate said switch operator, so that depression of said cover will actuate only said switch operator to send a signal to said indicator.

4,257,556
FLUID HEAT TRANSFER SYSTEM
Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402
Continuation-in-part of Ser. No. 575,414, May 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 756,392, Jan. 3, 1977, Pat. No. 4,164,253. This application Apr. 12, 1979, Ser. No. 29,568
Int. Cl.[3] F24H *3/06*
U.S. Cl. 237—7 **3 Claims**



1. A fluid heat transfer system comprising
a plurality of intermittent users having maximum working temperatures which degrade a degradable thermal exchange fluid at a significant rate and having periods of substantial duration when all said users are at temperatures which do not degrade the thermal exchange fluid at a significant rate,
a first fluid circuit in which the thermal exchange fluid can circulate comprising a first portion of an intermediate heat exchanger, a supply conduit and a return conduit connecting to the first portion of the intermediate heat exchanger, means to develop a differential pressure between the supply conduit and the return conduit, the intermittent users each connecting between the supply conduit and the return conduit, and means to regulate flow of the thermal exchange fluid through each of the intermittent users to control current working temperature,
a second fluid circuit comprising a second portion of the intermediate heat exchanger, a hot reservoir maintained at a temperature which is at least the highest of the maximum working temperatures, conduits connecting the second portion of the intermediate heat exchanger to the hot reservoir, and means to circulate a stable heat transfer fluid in the second fluid circuit thereby transferring heat

from the hot reservoir through the intermediate heat exchanger to the degradable thermal exchange fluid,

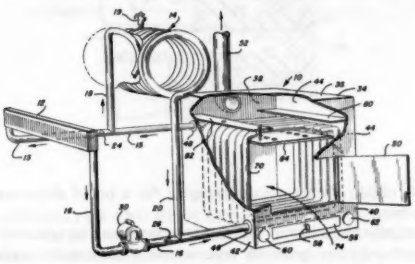
means to detect a current maximum setpoint temperature of the intermittent users, means to sense temperature of the thermal exchange fluid in the intermediate heat exchanger, and means to control the circulation of the stable heat transfer fluid to maintain said sensed temperature of the degradable thermal exchange fluid in the intermediate heat exchanger at the current maximum setpoint thereby extending lifetime of the degradable thermal exchange fluid without compromising effective heating capability of the intermittent users.

4,257,557

FLUID HEATING SYSTEM UTILIZING SOLID FUEL

William S. Thomasma, Old Plank Rd., De Pere, Wis. 54115, and John F. Wilson, P.O. Box 862, Green Bay, Wis. 54305

Filed Oct. 27, 1978, Ser. No. 955,193
Int. Cl.³ F24D *3/08*
U.S. Cl. 237—19 **19 Claims**



1. In a fluid heeating stove having a substantially closed firebox for the combustion of solid fuels and venting means for controlling the inlet and exhausting of combustion air, a continuous fluid carrying conduit disposed within said firebox for supporting the fuels for combustion and for carrying a heat absorbing fluid into proximity with the burning fuel so as to allow for absorption of heat by said fluid, said conduit being shaped as a continuous coil having its axis disposed horizontally, said coil surrounding a center chamber which is disposed horizontally within said firebox, the bottom of said horizontally disposed coil having conduit portions spaced apart so as to define a grate for supporting said fuel while allowing for the passage of combustion air to the burning fule, said fire box having shell portions along the sides of said coil with secondary air inlet means there in the upper sides of said coil having conduit portions spaced apart to allow combustion air which has been heated by passage along the said shell portions to enter said center chamber, said chamber further having a horizontally disposed baffle plate internal to and near the top of said chamber above said secondary air inlet means for diverting the gases released from combustion of said fuel toward the sides of said center chamber and into contact with said heated combustion air entering through the upper sides of said coil to cause combustion of said released gases and enhance the uniformity of heat distribution throughout said coil.

4,257,558

CONTENT INDICATING DISPENSER UTILIZING DISPLACEMENT OF THE CENTER OF GRAVITY OF THE CONTENTS AND THE DISPENSER TO PROVIDE AN INDICATION OF THE QUANTITY OF CONTENTS REMAINING IN THE DISPENSER

Stanley I. Mason, Jr., 61 River Rd., Weston, Conn. 06880

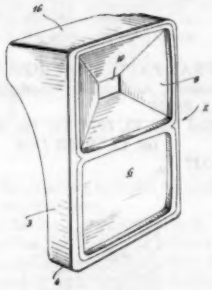
Filed May 23, 1979, Ser. No. 41,713
Int. Cl.³ A61L *9/04*
U.S. Cl. 239—57 **6 Claims**

1. A content indicating dispenser for vaporizable material such as room deodorants and insecticides, said dispenser including:

a housing for holding said vaporizable material, said housing defining at least one chamber therein for receiving said vaporizable material, and said housing having at least one discharge opening communicating with said at least one chamber through which said vaporizable material is released from said chamber and into the environment surrounding said dispenser,

a supporting base affixed to the bottom of said housing for supporting said housing in a vertical position on said supporting base,

said housing being so shaped and dimensioned relative to said supporting base that (1) the center of gravity of said housing and said vaporizable material within said housing is not substantially above said supporting base and said dispenser is physically unstable standing upright on its supporting base and will topple in the absence of a predetermined weight of said vaporizable material within said housing and (2) said center of gravity of said housing and



said vaporizable material within said housing is substantially above said supporting base when said vaporizable material exceeds said predetermined weight,

said housing including an integrally formed projection extending therefrom proximate the top of said housing, said projection extending beyond the periphery of said supporting base and being of such weight that the center of gravity of said housing is not substantially above said supporting base when no vaporizable material is within said housing,

whereby the weight of said vaporizable material controls the stability of said dispenser such that said dispenser is vertically stable on its supporting base only when at least said predetermined weight of said vaporizable material is within said housing,

and whereby a vertically upright dispenser indicates that the quantity of vaporizable material within said housing is at least equal to said predetermined weight, and a toppled dispenser indicates that the vaporizable material within said housing is less than said predetermined weight.

4,257,559

REMOVABLE AND SELF SEALING SPRAY MANIFOLD FOR COMMERCIAL DISHWASHER

Tore H. Noren, Petaluma, Calif. 94952

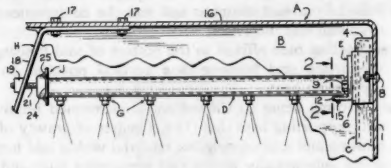
Filed Jul. 31, 1979, Ser. No. 62,294
Int. Cl.³ B05B *15/06*
U.S. Cl. 239—283 **5 Claims**

1. The combination with a dishwasher having a water inlet pipe with a water outlet opening and including:

(a) a first support for the inlet end of a spray manifold and having a conical outlet portion registering with the outlet opening in the pipe, the inlet end of the spray manifold being outwardly flared and adapted to receive said conical outlet portion and form a water tight seal therewith so

that water flowing through the pipe outlet will enter the spray manifold;

(b) a second support for the opposite open end of said spray manifold and including a closure cap, said cap having a conical portion for entering an adjacent outwardly flared open end of said spray manifold; and



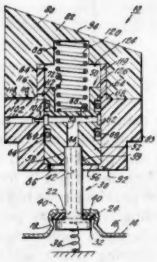
(c) means for moving said cap into sealing connection with the adjacent end of said manifold and for moving the manifold so that its inlet end is brought into a sealing connection with the outlet opening of said water inlet pipe.

4,257,560

PLURAL SPRAY PATTERN AEROSOL SPRAY HEAD

George B. Diamond, Anthony & Woodglen Rds., R.D., Glen Gardner, N.J. 08826

Filed Nov. 13, 1978, Ser. No. 960,455
Int. Cl.³ B05B 1/16
U.S. Cl. 239—337 **28 Claims**



1. A spray head for being mounted to the valve of an aerosol spray container, or the like container, said spray head comprising:

a first portion of said spray head, including a spool comprised of a body having a passage therethrough; said body having a plurality of sides; said passage having an inlet communicating from one said side of said body; said body passage inlet being connectable with the valve of an aerosol spray container; said body passage having an outlet;

a second portion of said spray head positioned next to said spool; said second portion being movable longitudinally of and with respect to said spool while remaining next to said spool; said second portion having a first and a second outlet conduit means therethrough, both extending from the side of said second portion next to said spool to the outside of said second portion; said first and second outlet conduit means being spaced apart longitudinally along said second portion such that with said second portion at a first longitudinal position with respect to said spool body, said first outlet conduit means is positioned in communication with said body passage outlet, and with said second portion at a second longitudinal position with respect to said body, said second outlet is positioned in communication with said body passage outlet;

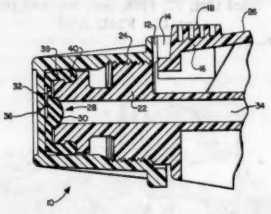
said first and second outlet conduit means and said body passage outlet being respectively so placed that, without prior operator selection of a position for said second portion with respect to said spool by motion of said second portion across the direction of longitudinal motion of said second portion, said second portion may be shifted longitudinally between said first and said second longitudinal positions.

4,257,561

CHILD-RESISTANT DISPENSING NOZZLE ASSEMBLY

James C. McKinney, Alpharetta, Ga., assignor to Ethyl Products Company, Richmond, Va.

Filed Jun. 5, 1979, Ser. No. 45,637
Int. Cl.³ B05B 1/30
U.S. Cl. 239—581 **7 Claims**



1. A child-resistant nozzle assembly for a liquid dispenser comprising:

a. nozzle means having a downstream end and an upstream end and being generally hollow inside, said nozzle means having slot means in the upstream end, said nozzle means having thread means thereon which engage thread means on said body means for connecting said nozzle means to said body means;

b. dispenser body means connectable to said nozzle means having lug means flexibly connected thereto for selective receipt within said slot means to prevent said nozzle means from turning when said lug means is received in said slot means;

c. conduit means in said dispenser body means for supplying liquids to said nozzle means; and,

d. flexible valve means located between said nozzle means and said conduit means.

4,257,562

APPARATUS FOR FEEDING LIQUID ADHESIVE

Roberto Zini, Bologna, Italy, assignor to CIR S.p.A. Divisione ASAIB, Bologna, Italy

Filed Apr. 5, 1979, Ser. No. 27,394
Claims priority, application Italy, Apr. 6, 1978, 12551 A/78
Int. Cl.³ B01D 19/00
U.S. Cl. 239—590.3 **11 Claims**

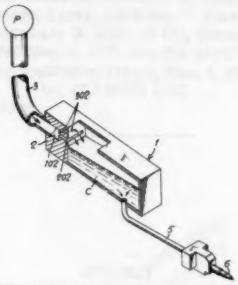
1. Apparatus for feeding liquid adhesive under pressure to an applicator, comprising:

(a) first conduit means for supplying the liquid adhesive under pressure;

(b) a degasifying device for expelling gases from the liquid adhesive, said degasifying device consisting of a narrow horizontal slit passage connected to said first conduit means, said horizontal slit passage presenting a constant height and progressively increasing in width in the direction away from said first conduit means, through which slit passage the adhesive is compelled to pass;

(c) a gastight buffer chamber receiving the degasified liquid

adhesive and the expelled gases from said degasifying device; and



(d) second conduit means for conducting the degasified adhesive under pressure from said buffer chamber to the applicator.

4,257,563

APPARATUS AND PROCESS FOR PRODUCING WOOD PULP IN A PRESSURIZED WOOD GRINDER

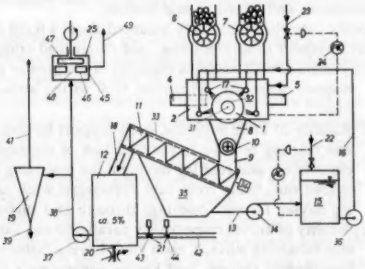
Hans Henrich, Heidenheim, Fed. Rep. of Germany, assignor to J.M. Voith GmbH, Fed. Rep. of Germany

Filed May 2, 1979, Ser. No. 35,256

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1978, 2851601

Int. Cl.³ B02C *23/38*

U.S. Cl. 241—17 **15 Claims**



1. A process for producing wood pulp, comprising: feeding wood into a housing; grinding the wood in the housing; pressurizing the housing, in which the wood is being ground, above atmospheric pressure;

feeding water to the zone in the housing where the wood is being ground and heating the water being fed to the wood in the housing to over 100° C.;

collecting the wood pulp thereby produced, while holding the wood pulp under pressure; removing water from the wood pulp then under pressure, while holding the water under pressure and the removed water being still heated;

said feeding of water to the zone in the housing where wood is being ground comprising feeding water that has been removed from the wood pulp and which water is still being held under pressure and is still heated.

4,257,564

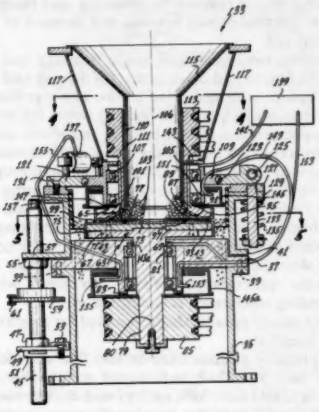
APPARATUS AND METHOD FOR CRUSHING MATERIAL

James B. Pamplin, 11612 Morgan La., Garden Grove, Calif. 92640

Filed Aug. 9, 1979, Ser. No. 65,060

Int. Cl.³ B02C *7/10*

U.S. Cl. 241—30 **21 Claims**



1. An apparatus for crushing material comprising:

first and second crushing jaws;

each of said jaws having a crushing surface;

said crushing surfaces being inclined relative to each other to define an acute angle no larger than about 45°, said crushing surfaces at least partially defining a crushing cavity for receiving material to be crushed by said crushing jaws;

means for mounting said jaws for relative movement along a path generally parallel to said crushing surface of said first jaw so that said jaws are essentially prevented from moving away from each other during normal operation of the apparatus, at least a component of said path lying in the plane of the acute angle; and

means for relatively moving said jaws along said path, said jaws being configured so that the material in said crushing cavity is compressively loaded and crushed by the crushing surfaces of the jaws.

4,257,565

DESK-TOP SHREDDER

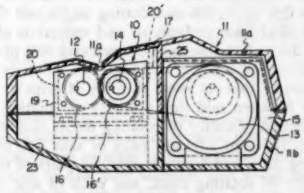
Takefumi Hatanaka, Matsudo, Japan, assignor to Lifewell Corporation, Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,745

Claims priority, application Japan, Oct. 11, 1978, 53/124089

Int. Cl.³ B02C *18/22*

U.S. Cl. 241—100 **6 Claims**



1. An electrically driven desk-top shredder for cutting document sheets into small fragments, comprising:

a housing having a document-receiving slot through an upper portion of said housing and dimensioned to permit documents to be inserted through said slot and into said housing;

a drive motor fixedly mounted within said housing at a rear portion thereof;

a removably mounted receptacle for receiving small fragments of shredded documents;

mounting means removably mounting said receptacle at a lower portion of said housing and forward of said drive motor; and

a shredding mechanism and means coupling said shredding mechanism to said drive motor for driving said shredding mechanism with said drive motor, said shredding mechanism mounted within said housing below the slot through the upper portion of said housing and above said receptacle for receiving in use a document to be shredded which is inserted into said shredding mechanism through the slot and for depositing chips produced in use during shredding of the document into said receptacle below said shredding mechanism, and said shredding mechanism being mounted forward of said drive motor with the uppermost part of said shredding mechanism being substantially no higher than the uppermost part of said drive motor, wherein said shredding mechanism is comprised of;

first and second parallel shafts mounted for rotation in opposite directions;

a first plurality of discs fixed on said first shaft for rotation with said first shaft and spaced at intervals along the length of said first shaft, each of said discs having a plurality of shredding blades peripherally mounted thereon and spaced circumferentially thereof;

a second plurality of discs fixed on said second shaft for rotation with said second shaft and spaced at intervals along the length of said second shaft, each of said discs having a plurality of shredding blades peripherally mounted thereon and spaced circumferentially thereof;

adjacent discs of said first plurality of discs defining spaces therebetween, adjacent discs of said second plurality of discs defining spaces therebetween, and said first and second parallel shafts relatively positioned with respective discs of said first plurality of dsics inserted between adjacent discs of said second plurality of discs and with respective discs of said second plurality of discs inserted between adjacent discs of said first plurality of discs;

a plurality of stationary spacers each mounted between a respective adjacent pair of discs in one plurality of discs and opposite a corresponding disc in the other plurality of discs, each of said spacers having a thickness slightly less than its corresponding disc and having a peripheral contour defining a guide surface leading down toward said first and second plurality of discs and an arcuate surface opposite and adjacent the corresponding disc and extending upwardly toward and meeting said guide surface at a certain angle, said guide surface and said arcuate surface meeting at an edge defining a cutting edge on said spacer, and said cutting edge of said spacer being positioned close to the circular locus of the outermost portions of said shredding blades;

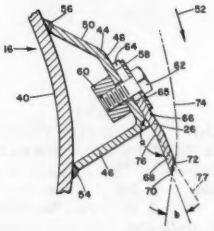
whereby rotation of said first and second parallel shafts in opposite directions and in directions so that said shredding blades first approach said cutting edges and then sweep past said arcuate surfaces of said spacers is effective to shred documents inserted between said first plurality and said second plurality of rotating discs, wherein each such document is first cut into a plurality of strips by a shearing action between said first plurality of rotating discs and said second plurality of rotating discs, said strips being formed between adjacent pairs of said first plurality of rotating discs and between adjacent pairs of said second plurality of rotating discs, and each of said strips then being guided by the guide surface of a corresponding spacer to advance between the cutting edge of the corresponding spacer and the shredding blades of the rotating disc opposite the corresponding spacer, and successive fragments being successively cut from each advancing strip as successive shredding blades sweep past the cutting edges and the arcuate surfaces as the corresponding discs rotate.

4,257,566

CUTTERHEAD FOR FORAGE HARVESTERS AND THE LIKE

Allan K. Lawrence, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jul. 10, 1979, Ser. No. 56,385
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—221 **6 Claims**



1. A forage harvester comprising:

cutterhead housing having an arcuate closed bottom,

a stationary knife fixed to said bottom,

a rotary cutterhead rotatably mounted about a fixed axis and with respect to said housing, said cutterhead comprising:

a cylindrical wall having a diameter much greater than the distance from the cylindrical wall to the arcuate bottom,

a plurality of knife supports, each support having a front and rear leg relative to the direction of rotation of the cutterhead, said rear leg having a flat mounting surface spaced outwardly from said cylindrical wall, said rear leg having fastener openings through said surface,

a plurality of knives respectively parallel to and carried on said mounting surface, each knife having fastener openings formed therein, said knives generating a cylinder when said cutterhead is rotated, each knife having (1) an integral flat portion resting on its respective mounting surface and (2) an integral leading portion extending forwardly, relative to the direction of cutterhead rotation, from said flat portion and overhanging its respective mounting surface, said leading portion terminating in a cutting edge, said flat portion and leading portion of each knife meeting at a bend line parallel to and forward of the respective mounting surface, said edge lying radially inwardly of a coplanar extension of the lower surface of said flat portion,

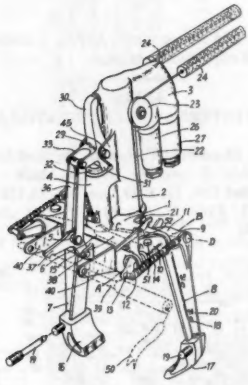
a plurality of fasteners inserted through each said knife and each said mounting surface, said fasteners projecting outwardly from said knife and spaced slightly inwardly of said shear bar when said cutterhead is rotated and each said knife passes said bar.

4,257,567

RETRACTABLE GRIPPING-ARM DEVICE FOR TRANSPORTING AND JETTISONING RINGLESS LOADS CARRIED UNDER AIRCRAFT

Jean H. Hasquenoph, Lagny, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

Filed Mar. 1, 1979, Ser. No. 16,657
Claims priority, application France, Mar. 1, 1978, 78 05834
Int. Cl.[3] B64D *1/02*
U.S. Cl. 244—137 R 4 Claims



1. A device, for transporting and jettisoning ringless loads carried under aircraft, said loads, having a longitudinal axis and having an upper face when carried under the aircraft, comprising:

(i) a supporting block including a cylinder and a housing,

(ii) an ejection piston slidable in said cylinder and adapted to engage said upper face of the load,

(iii) at least one pyrotechnical impeller fixed in said housing and adapted to control the sliding of said ejection piston,

(iv) means to return said ejection piston to a retracted inoperative position after firing of said pyrotechnical impeller,

(v) a pair of universal joints carried by said supporting block,

(vi) a pair of pivoted gripping arms, acting as jaws and adapted to clamp the load for the carrying thereof, each universal joint being associated with one of said gripping arms to allow said arms to pivot both in a plane perpendicular to the load axis, to ensure the gripping, carrying and releasing of the load, and also in a direction parallel to the load axis for the retraction of said gripping arms in the airstream,

(vii) locking means for maintaining said gripping arms in their gripping position,

(viii) means automatically ensuring the release of said locking means under the control of said pyrotechnical impeller,

(ix) first spring means automatically ensuring a spacing of the gripping arms in a plane perpendicular to the load axis when said locking means are released, and

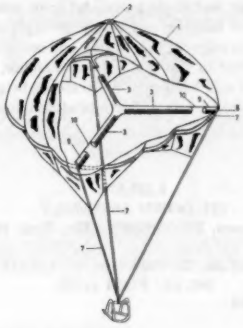
(x) second spring means associated with each gripping arm to assist pivoting of said gripping arms parallel to the load axis under the force of the airstream when the load has been released.

4,257,568

PREINFLATABLE EXPANSION DEVICE FOR LOW ALTITUDE ESCAPE OR SPORTING PARACHUTE

Henrique O. Bücker, Box 18394, Sao Paulo SP, Brazil 01000

Filed Mar. 14, 1979, Ser. No. 20,476
Claims priority, application Brazil, Mar. 30, 1978, PI 7802004
Int. Cl.[3] B64D *17/72*
U.S. Cl. 244—146 3 Claims



1. In an inflatable type expansion device for low altitude escape or sporting parachute, said expansion device having an inflatable tubing frame, means to inflate said tubing frame, a retaining device to maintain said tubing frame in a folded position enveloped by a parachute canopy when preinflated, means to release said retaining device, the improvement comprising:

said inflatable tubing frame's projected area being smaller than said canopy's projected area,

attaching devices to hold said canopy and tubing frame together in a non-fixed relationship to expand said canopy when said tubing frame is inflated and straightened and to permit said canopy to disengage from said tubing frame when said canopy deploys, thereby permitting said canopy to deploy unrestrained, and

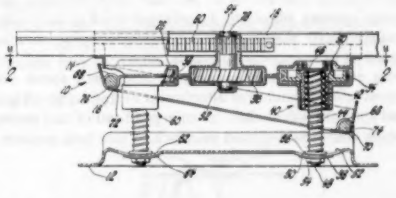
means to maintain said tubing frame suspended underneath said canopy after said canopy deploys.

4,257,569

POWER SEAT ADJUSTING MECHANISM FOR A PLATFORM SEAT

John A. Budinski, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 26, 1979, Ser. No. 60,885
Int. Cl.[3] B60N *1/02*
U.S. Cl. 248—394 4 Claims



1. A seat adjusting mechanism comprising: a base member; a seat platform member; a seat support member slidably supporting said seat platform member; a link member hinged at first spaced locations to said base member and at second spaced locations to said seat support member at a location longitudinally displaced from the first spaced locations; first vertical drive means drivingly connected to said base member and housed in said seat support member between said first spaced

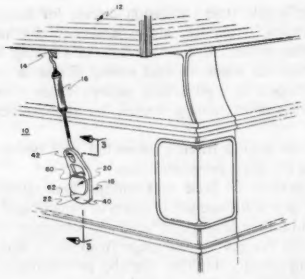
hinge locations on said seat support member for raising and lowering one portion of said seat support member relative to said base member; second vertical drive means drivingly connected to said base member having the drive axis coplanar with the drive axis of the first vertical drive means disposed between said second spaced hinge locations on said base member and being housed in said seat support member for raising and lowering another portion of said seat support member relative to said base member; and single horizontal drive means housed in said seat support member and being drivingly connected to said seat platform member for moving said seat platform member linearly relaive to said seat support member, said vertical drive means and said horizontal drive means being selectively operable to position a seat within a predetermined space.

4,257,570

TIE DOWN ASSEMBLY

Carl M. Rasmussen, 374 S. Stirling Dr., Fruit Heights, Utah 84037

Filed Jul. 31, 1978, Ser. No. 929,373
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—503 **4 Claims**



4. A tie down assembly for attachment to a turnbuckle, said tie down assembly comprising in combination:

anchor means comprising an enlarged head having a dimension which is smaller in the generally vertical plane than in the generally horizontal plane; and

bracket means comprising a base portion and a coupling portion, the base portion being joined to the coupling portion at an obtuse angle and having a slotted interlock formed in the base portion and sized to receive the neck of the anchor means in movable relation, the slotted interlock communicating with an enlarged access opening in the coupling portion at its juncture with the base, said access opening admitting the enlarged head of the anchor means only by planar translation movement of the bracket means in the generally horizontal direction, and said coupling portion having an aperture positioned above said access opening such that attachment of said turnbuckle to said aperture will anchor the enlarged head of said anchor means within said slotted interlock of said base portion.

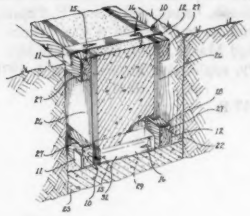
4,257,571

FOUNDATION CLIP ASSEMBLY

Virgil D. Franks, Mesa, Ariz., assignor to Charles E. Cates, Phoenix, Ariz., a part interest

Filed Apr. 10, 1978, Ser. No. 894,866
Int. Cl.³ E04G *17/00, 17/02*
U.S. Cl. 249—207 **7 Claims**

1. A foundation clip assembly comprising a clip comprising a web, upturned ends integral with said web, and sleeve means covering and including a part of said web intermediate the



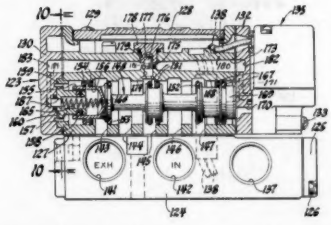
upturned ends, said sleeve means having a cross-section void larger than said clip in cross-section.

4,257,572

VALVE WITH INTERNAL ACCUMULATOR AND CHECK VALVE

James A. Neff, Bloomfield Township, Oakland County, Mich., assignor to MAC Valves, Inc., Wixom, Mich.

Filed Feb. 22, 1979, Ser. No. 14,129
Int. Cl.³ F16K *31/124;* F15B *13/043, 20/00*
U.S. Cl. 251—30 **8 Claims**



1. A pilot air operated air valve including a valve body with a pressurized air supply chamber and having an axially movable valve spool operatively mounted therein which is moved in one direction by a return spring and in the other direction by pressurized pilot air controlled by a pilot valve, characterized in that:

(a) an accumulator chamber is formed in the valve body and it is connected by passageway means to a supply source of pilot air and to the pilot valve for supplying pilot air to the pilot valve; and,

(b) the accumulator chamber is connected by passageway means, which is not connected to the air supply chamber, to an air return chamber communicating with the valve spool for admitting pilot air from the accumulator chamber to the air return chamber to assist the return spring in its valve spool return action.

4,257,573

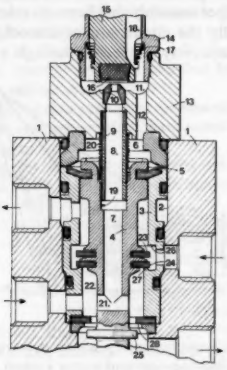
ELECTROMAGNETIC VALVE WITH SERVO-CONTROL

Harald Stampfli, Petit-Saconnex, Switzerland, assignor to Lucifer S.A., Carouge-Geneva, Switzerland

Filed Apr. 3, 1979, Ser. No. 26,725
Claims priority, application Switzerland, Apr. 4, 1978, 3590/78
Int. Cl.³ F16K *31/128*
U.S. Cl. 251—30 **2 Claims**

1. An electromagnetic valve with servo control, comprising a valve body having a body part fixed thereto, said valve body formed with a work chamber therein, an active member axially displaceable under fluid pressure contained in said work chamber, a tube attached to said body part, an electromagnetically movable core slidable in said tube, a valve seat in said body part, said core having an obturator engageable with said valve

seat for controlling admission and escape of fluid, said active member having an inner axial boring, a coaxial tubular member mounted at one end in the body part and at the other end in the axial boring of said active member, said tubular member being slidably mounted to permit displacement of said active member



relative to the body part of the valve, said tubular member being made of resilient material, a helical spring engaging the outer surface of the tubular member and bearing against said active member at one end and against the body part at the other end.

4,257,574

SPHERICAL VALVE SEAL

Selim A. Chacour, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 2, 1979, Ser. No. 26,431
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—172 **1 Claim**

1. In a spherical valve having a valve body presenting a fluid inlet and outlet;

a valve rotor having an axis of rotation and provided with a fluid passageway supported within said valve body for positioning between an open position wherein the passageway therein is aligned with the valve body inlet and outlet and a closed position wherein the passageway is rotated so that fluid flow through the valve is blocked;

a movable piston ring seal carried by said valve body and surrounding said inlet and/or outlet openings;

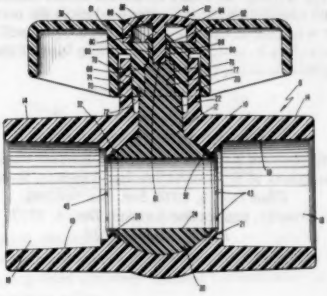
a fixed seat ring seal secured to said rotor in position around the ends of the passageway therein that is associated with the inlet and/or outlet openings of the valve body and operable in cooperation with said movable piston ring seal to effect a fluid seal, said rotor seat ring seal being formed so as to present a minimum thickness contour at points 180° apart from each other and in a plane which passes through the axis of rotation of the rotor and having a maximum thickness contour at points 180° apart from each other and which are 90° from the plane which passes through the axis of rotation of the rotor so as to be operable to compensate for the differential deflections of the rotor and the seat ring seal when said rotor is under maximum static load.

4,257,575

ROTARY BALL VALVE HAVING SEATING RINGS

Gary L. Runyan, Louisville, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Oct. 12, 1978, Ser. No. 950,550
Int. Cl.³ F16K *31/00*
U.S. Cl. 251—292 **14 Claims**



1. A plug valve comprising:

A housing having a fluid passage,

a plug rotatably mounted in the housing and including a gate located within said housing passage and having a passage which is communicable with said housing passage to conduct fluid when the valve is open, and

a pair of seating rings mounted in said housing, said seating rings formed of anti-friction material and arranged on opposite sides of said gate such that front sides of said rings contact said gate and encircle respective ends of said gate passage in the valve-open position,

said housing including support means supporting each seating ring, each support means comprising

a plurality of flange segments separated by open spaces arranged in circumferentially spaced relation around said housing passage in contacting relation with the back side of an associated seating ring to urge the associated seating ring against said gate,

said flange segments projecting generally radially inwardly to an inner diameter of said seating ring and being individually yieldable to enable said seating rings to conform to the shape of said gate.

9. A valve according to claim **1** wherein said seating rings are formed of poly(tetrafluoroethylene).

4,257,576

ROTARY COCKS CARRYING SPHERICAL SEALS

Andre Legris, St-Maur, France, assignor to Legris Incorporated, Rochester, N.Y.

Division of Ser. No. 745,643, Nov. 29, 1976, Pat. No. 4,172,584.
This application Mar. 19, 1979, Ser. No. 21,466
Claims priority, application France, Dec. 9, 1975, 75 37647
Int. Cl.³ F16K *5/06*
U.S. Cl. 251—315 **1 Claim**

1. A cock comprising a body, piping means for the flow of liquid connected to said body, a shut-off member rotatably

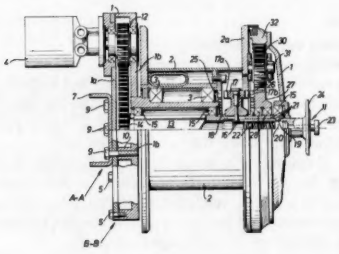
mounted in the body by means of a manipulation member, said shut-off member comprising a dome with a spherical surface, a sealing gasket of annular shape secured to said body, the shut-off member comprising two lugs extending from the points of longest distance from said surface, said lugs being parallel to the axis of the shut-off member which passes through the center of the shut-off member, the first lug being connected to said manipulation member rotatably mounted in said body, the second lug having the shape of a fork which forms a recess, and a stub engaging with said recess, wherein the manipulation member is a spindle, the first lug is folded onto itself and has a square aperture in which a corresponding boss of the manipulation spindle is engaged.

4,257,577

MOTOR VEHICLE WINCH

Erik Eriksson, and Lennart Geschwind, both of Vansbro, Sweden, assignors to Sepson Aktiebolag, Vansbro, Sweden

Filed Dec. 6, 1978, Ser. No. 966,954
Claims priority, application Sweden, Dec. 6, 1977, 7713838
Int. Cl.[3] B66D *1/24*
U.S. Cl. 254—344 **2 Claims**



1. Winch having a rotatable drum, a driving motor and a gear box containing a planetary gearing comprising gears driving the drum, the planetary gearing or the drum being selectively operable by a coupling device to change the rotational speed of the drum, the coupling device comprising two dog elements which are connected to each other, rotatable by the motor and displaceable along the rotational axis of the drum to take up any of three positions in relation to the drum, in the first position one of the dog elements engaging a dog element fixed to the drum, in the second position the other dog element engaging a sun gear of the planetary gearing, the sun gear transferring rotational motion to the drum via planet gears and a ring wheel, one of said planet gears or said ring wheel being connected to the drum, and in the third position none of the two dog elements of the coupling device engaging the dog element of the drum or the sun gear.

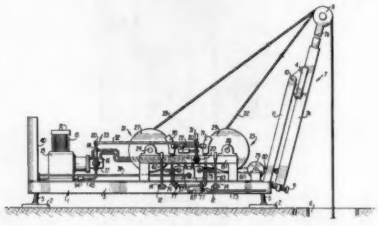
4,257,578

OIL WELL SERVICE RIG

Walter H. Allen, P.O. Box 3344, Parkersburg, W. Va. 26101

Filed Jul. 11, 1978, Ser. No. 923,658
Int. Cl.[3] B66D *1/08, 1/26*
U.S. Cl. 254—298 **12 Claims**

1. A service rig comprising at least one line reel and driving means engaging said reel to rotate same in either one of two directions, said driving means including a hydraulic, reversible pump and motor system and a power source operating said hydraulic pump at substantially constant speeds, settable control means connected to said hydraulic pump, said hydraulic pump supplying varying amounts of fluid to operate said hydraulic motor with a substantially constant torque at selected speeds and a continuously constant hydraulic pressure responsive to the settings of said control means, said control means being manually operable, a mechanical linkage connected to said control means in said hydraulic pump, said control means being displaceable from a neutral position to either one of two operative positions and directing fluid flow from said hydraulic pump to said hydraulic motor driving said hydraulic motor in either one of two opposite directions, said reel having two end discs for confining said cable wound around said reel, one of said discs being larger than the other said disc, said one disc having a brake caliper assembly that bears on relative opposite sides at substantially the circumference thereof, said caliper assembly being operatively connected through a valve mem-



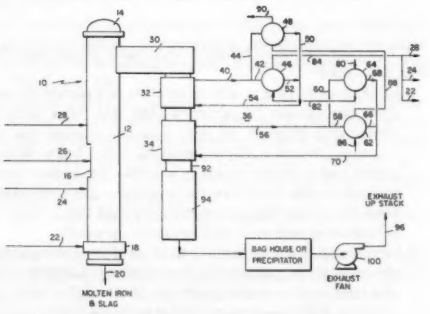
ber to a second hydraulic assembly which is completely independent of said hydraulic pump and motor system, said linkage being movable and said valve member being displaceable from a neutral position by said mechanical linkage, said reel being braked by the caliper assembly bearing on both sides of said one disc, and a gear assembly operatively connected to the output of said hydraulic motor, said gear assembly comprising a driven gear that engages and rotates said reel to pay out and retrieve line.

4,257,579

WASTE HEAT RECOVERY PROCESS AND APPARATUS

Alfred Bruhn, East Chester, N.Y., and William Bernard, Winnetka, Ill., assignors to American Hydrotherm Corp., New York, N.Y.

Continuation of Ser. No. 813,169, Jul. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 768,087, Feb. 14, 1977, abandoned. This application Jan. 11, 1979, Ser. No. 2,688
Int. Cl.[3] C21B *9/00*; F28D *21/00*
U.S. Cl. 266—141 **9 Claims**



1. In a process for recovering heat from an exhaust gas having a temperature of from 500° to 2500° F. generated in a unit operation effecting an exothermic reaction and cycling between an operational mode and an idling mode, the improvement comprising:

(a) passing said exhaust gas during said operational mode in indirect heat transfer relationship to at least two intermediate heat transfer media in at least two successive heat exchange zones operating at different temperature levels;

(b) recovering heat from said intermediate heat transfer media at different temperature levels;
(c) passing one intermediate heat transfer media through a first heat transfer zone;
(d) passing another intermediate heat transfer medium having a lower operational temperature level through a succeeding heat transfer zone;
(e) passing an air stream sequentially through said succeeding heat transfer zone and said first heat transfer zone to preheat said air stream;
(f) introducing said preheated air into said unit operation;
(g) passing said intermediate heat transfer media to respective storage zones
(h) during the idling mode passing said intermediate heat transfer media from said storage zones to a user other than the unit operation; and
(i) passing to step (a) said intermediate heat transfer media from said storage zones.

4,257,580

PNEUMATIC SPRING

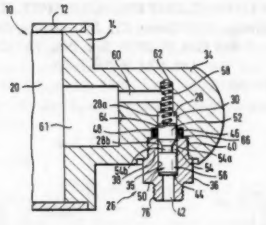
Klaus Schnitzius, Rheinbrohl, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,548

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1978, 7825656[U]

Int. Cl.³ F16F 9/43

U.S. Cl. 267—65 R **20 Claims**



1. In a pneumatic spring including a cylinder having a closed end wall and an apertured end wall, a piston rod extending through said apertured end wall for reciprocation within said cylinder, seal means for establishing a fluid tight seal between said apertured end wall and said piston rod, and a valve in said cylinder for establishing fluid connection between the interior and exterior of the cylinder, the improvement in said valve comprising:
(a) means defining a generally cylindrical valve channel, a first part of which is in fluid connection with the interior of the cylinder and a second part of which is in fluid connection with the exterior of the cylinder;
(b) means defining an annular groove opening into said valve channel and extending radially outward from the longitudinal axis thereof;
(c) a valve body having a first, generally cylindrical portion and a second portion smaller in cross section than said first portion, said valve body being mounted within said valve channel for axial movement therein between a first position and a second position;
(d) an annular sealing member housed within said annular groove in surrounding relation to said valve body, said sealing member (1) engaging said first valve body portion and sealing said first valve channel part from said second valve channel part when said valve body is in said first position and (2) being in alignment with said second valve body portion and permitting fluid flow between said first and second valve channel parts when said valve body is in said second position;
(e) means for normally biasing said valve body towards said first position; and
(f) means for enabling movement of said valve body to said second position against the force of said biasing means.

4,257,581

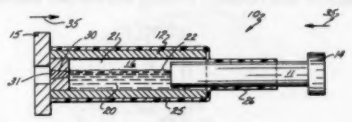
IMPACT ABSORBING STRUT

Miner S. Keeler, II, Grand Rapids, Mich., assignor to Keeler Corporation, Grand Rapids, Mich.

Filed Jul. 25, 1979, Ser. No. 60,452

Int. Cl.³ F16F 9/36

U.S. Cl. 267—116 **3 Claims**



1. A shock absorber comprising:
first and second relatively movable telescoping tubes;
a damping fluid chamber defined by said first and second telescoping tubes;
a quantity of damping fluid partially filling said chamber;
a quantity of compressible gas filling the remainder of said chamber to absorb small loads;
a fluid throttling port extending through one of said tubes and communicating with said chamber through which said damping fluid is forced when said shock absorber is heavily loaded;
a blowout plug normally disposed in said port, said plug being adapted for ejection from said port at a predetermined chamber pressure;
a frangible polymeric encasement surrounding said shock absorber and secured thereto for sealing said damping fluid and said compressible gas therein, said encasement having sufficient resiliency to absorb small deflections of said first and second telescoping tubes without rupturing and rupturing upon large deflections of said first and second telescoping tubes.

4,257,582

SUPPORT COLUMN OF ADJUSTABLE LENGTH

Winfried Wirges, Koblenz-Moselweiss, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Dec. 17, 1975, Ser. No. 641,555

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1974, 2459340

Int. Cl.² F16M 11/00

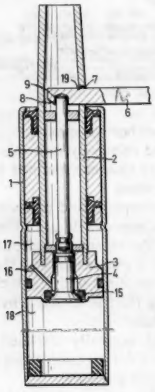
U.S. Cl. 267—120 **9 Claims**

1. A column of adjustable length comprising:
(a) two longitudinal column elements interengaged for relative longitudinal movement, one of said elements having a longitudinal axis and being formed with an axial bore and a radial opening communicating with said bore;
(b) locking means for locking said elements relative to each other and for thereby preventing said movement;
(c) releasing means for releasing said locking means,
(1) said releasing means including a releasing member movable in said bore between first and second axial positions,
(2) said locking means responding to movement of said releasing member from said first axial position by permitting said relative movement of said column elements;
(d) biasing means yieldably biasing said releasing member toward said first axial position;
(e) an operating member passing through said opening and having respective portions inside and outside said bore;
(f) cooperating coupling means on said members,
(1) said coupling means including cam means responsive to movement of said operating member radially inward of said opening into abutting engagement with said

releasing member for shifting said releasing member from said first position toward said second position against the restraint of said biasing means, one of said members being formed with a recess open toward the other member,

(2) said coupling means further including a portion of said other member received in said recess under the biasing force of said biasing means when said operatng member is moved further inward of said opening after said shifting,

(3) said coupling means coupling said members for movement of said releasing member toward said second axial



position by manual axial movement of the portion of said operating member outside said bore in the direction away from said second axial position of said releasing member; and

(g) means for preventing sufficient axial movement of said portion of said operating member outside said bore in the direction towards said second axial position of said releasing member to permit said portion of said other member received in said recess in said one member from withdrawing from said recess, whereby radially outward movement of the coupled operating member from said opening is prevented.

4,257,583

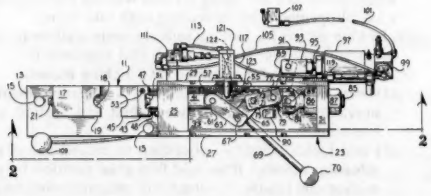
CLAMPING DEVICE

James W. Carson, Rte. 1, Box 62, Fayetteville, Ark. 72701

Filed Feb. 29, 1980, Ser. No. 125,870

Int. Cl.³ B25B *1/14*

U.S. Cl. 269—32 **10 Claims**



1. Power aided clamping apparatus comprising

a base,

a movable clamp element,

means for restraining said clamp element for linear movement relative to said base,

a first toggle link pivotally attached at one end to said clamp element,

a second toggle link pivotally attached at one end to the other end of said first toggle link,

a third toggle link,

means for pivotally securing a first end of said third toggle link in a fixed position relative to said base,

means for coupling the other end of said second toggle to the other end of said third toggle link and restraining said other end of said second toggle link to linear motion relative to said base,

a lever attached to one of said first and said second toggle links for imparting motion to said clamp element relative to said base by motion of said first and second toggle links,

an arm rigidly secured to said third toggle link,

power actuation means coupled to said arm for powered actuation of said third toggle link to produce linear motion of said other end of said second toggle link,

an over center stop for said other end of said third toggle link,

means for resiliently urging said clamp element in the clamp release direction,

an over center stop for the junction of said first and second toggle links,

means for urging the junction of said first and said second toggle links away from the last said over center stop, and

means for sensing the over center position of said first and second toggle links and causing actuation of said power actuator.

4,257,584

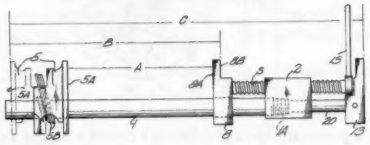
COMBINATION CLAMPING AND SPREADING TOOL

Larry P. Sterling, 1185 Genie Ct., SE., Salem, Oreg. 97302

Filed Oct. 9, 1979, Ser. No. 82,712

Int. Cl.³ B25B *1/10*

U.S. Cl. 269—88 **5 Claims**



1. A tool for alternatively exerting clamping forces or spreading forces on spaced apart article surfaces, said tool comprising,

a base of elongate shape having a tail stop thereon,

a boss on one end of said base and defining an internally threaded bore, and

a traveler assembly including a screw shaft engaged with said threaded bore of the boss, means for imparting rotation and hence axial movement to said screw shaft, a first biasing member at one end of said screw shaft, a second biasing member at the remaining end of said screw shaft, said biasing members adapted for joint movement relative said boss upon screw shaft rotation whereby a biasing member may in conjunction with said tail stop exert forces on abutting surfaces.

4,257,585

SUPPORTING STRUCTURE

Sven E. Persbeck, Torslanda, Sweden, assignor to Götaverken Arendal AB, Sweden

Filed Sep. 25, 1979, Ser. No. 78,818

Claims priority, application Sweden, Sep. 27, 1978, 7810118

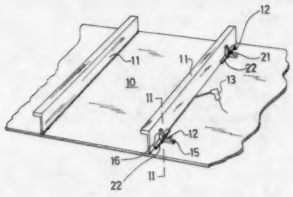
Int. Cl.³ B25B *5/14*

U.S. Cl. 269—133 **2 Claims**

1. A supporting structure for temporarily positioning an upright member with respect to a substrate, to which the member is to be permanently attached and comprising:

a pair of substantially L-shaped horses, each having a base

flange and a waist portion meeting at a substantially right-angled corner and further provided with a slot, which, in use, will form an angle of about 45 with the plane of the substrate, starting from said base flange, adjacent to said corner formed by said base flange and said waist portion, and



at least one plate member, each comprising a middle portion exceeding the thickness of said upright member, as well as two flanges continuing said middle portion, and adapted each to be removeably fitted into said slot at each horse of the pair provided to each side of the upright member,

each horse being provided with at least one tightening screw for locking by engaging the top face of said flange of the plate member introduced into the horse.

4,257,586

METHOD AND DEVICE FOR ALIGNING SHEETS TO BE PRINTED IN A PRESS

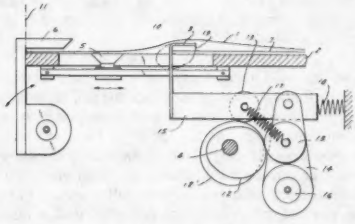
Günter Weisbach, Radebeul, German Democratic Rep., assignor to VEB Polygraph Leipzig, Kombinat für polygraphische Maschinen und Ausrüstungen, Leipzig, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 941,139

Claims priority, application German Democratic Rep., Sep. 14, 1977, 652010

Int. Cl.³ B65H *9/00*

U.S. Cl. 271—235 **4 Claims**



1. A device for aligning sheets fed successively from a stack to a feed table of a printing press, comprising preliminary front stops arranged along a stationary first alignment zone provided in an intermediate portion of said table, a driving mechanism for said front stops, final front stops provided along a second alignment zone at the end of said table, lateral pull-in devices provided between the first and the second alignment zone for lateral adjustment of the sheets and a reciprocating suction device disposed for movement between said first and second alignment zones to positively engage the lower surface of the sheet and displace the sheet from said first alignment zone to said second alignment zone, said driving mechanism for said preliminary front stops including an articulated cams assembly comprising two cam discs supported on a common shaft, a first cam follower supported on a first rocking lever rotatable about a stationary journal pin, a second cam follower supported on a second lever pivotably connected to the free end of said first lever, said preliminary front stops being secured to the free end of said second lever and spring means for biasing said cam followers against assigned cams.

4,257,587

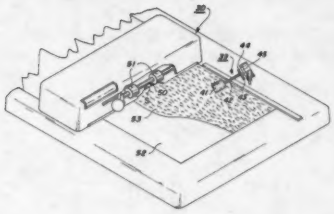
DOCUMENT REGISTERING AND FEEDING APPARATUS

Wayne R. Smith, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1978, Ser. No. 956,119

Int. Cl.³ B65H *9/16, 5/06*

U.S. Cl. 271—236 **16 Claims**



1. A document registering and feeding apparatus comprising;

a face surface over which a document may be fed;

a first registration member adjacent a portion of said face surface and extending in a direction substantially parallel to the direction in which a document may be fed, said registration member being adapted to contact a first side of said document;

a flexible registration and feeding member for driving a document into registration engagement with the first registration member and for feeding a document in a direction substantially parallel to the first registration member, said flexible registration and feeding member comprising a rotatable flexible drive shaft having a generally cylindrical deformable scuffer roll fixed to one end of said flexible drive shaft, said flexible drive shaft being cantilevered over said face surface, angled vertically with respect thereto and angled horizontally with respect to said first registration member, said scuffer roll being in pressure contact with said face surface and adjacent to but spaced from said first registration member, and means to rotate said flexible drive shaft;

said end of said flexible drive shaft having said scuffer roll fixed thereto being unsupported whereby a small laterally unrestricted oscillatory motion is imparted to the scuffer roll when in feeding engagement with a document.

4,257,588

EXERCISE BICYCLES

Jeffrey Ketchman, Westport, Conn., assignor to AMF Incorporated, White Plains, N.Y.

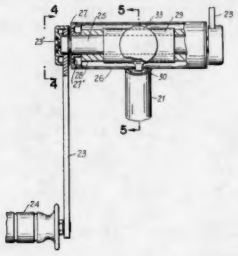
Filed Jun. 28, 1979, Ser. No. 52,996

Int. Cl.³ A63F *23/02*

U.S. Cl. 272—73 **1 Claim**

1. In an exerciser bicycle comprising a frame having a front fork head tube, a dual-crank type upper body and arm exerciser attachment removably connected to said head tube, said attachment comprising a tube having its lower end removably connected to said head tube, a pair of crank arms connected at one of their ends to opposite ends of a common shaft, rotary hand grips connected to the other ends of said arms, said arms being positioned along opposite sides of said bicycle and extending from said shaft in directions perpendicular thereto, means at said crank arm one ends and opposite shaft ends for connecting said crank arms to said shaft to extend from said shaft in either opposite directions or the same direction with respect to each other, a cylindrical member being affixed in a T-shaped arrangement to the upper end of said attachment tube, said shaft being positioned in said cylindrical member, spaced end bearings in said cylindrical member for opposite ends of said shaft, and a brake positioned in said cylindrical

member for imposing a drag on said shaft, said brake comprising an elastomeric material in said cylindrical member between said bearings, and means for forcibly urging said material into contact with said shaft, said material comprising a thick sleeve of resilient material having a Poisson's ratio of about 0.5, said sleeve being disposed snug on said shaft to turn therewith



between said bearings, said last mentioned means comprising a semi-cylindrical pressure plate positioned between said sleeve and cylindrical member, and means for manually varying the amount of force on said plate urging said plate into contact with said sleeve and said sleeve into forcible contact with said shaft to vary said drag.

4,257,589

ABDOMINAL EXERCISE DEVICE

Homer G. Outlaw, 855 N. Carrollton, Apt. 8, Baton Rouge, La. 70806

Filed May 14, 1979, Ser. No. 38,726
Int. Cl.[3] A63B *69/00, 69/20*
U.S. Cl. 272—93 **4 Claims**

1. A stomach exercise and muscle building device comprising:

a relatively heavy weight ball such as a bowling ball,

a suspension means for swingingly mounting said ball from an overhead support,

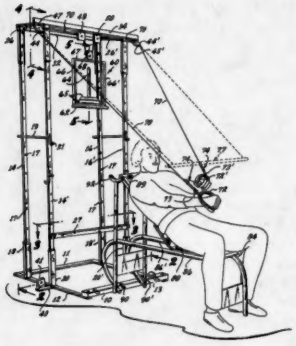
means at at least one end of said suspension means for permitting quick and easy height adjustment of the ball to approximately the stomach portion of the body of a person preparing to use the device, said suspension means for swingingly mounting the ball from an overhead support consists of a cord, said adjustment means includes a handle and cleat structure firmly attached to the ball for providing the height adjustment means, in conjunction with one end of the cord attached thereto, wherein said handle and cleat structure consist of an elongated rod having threads at one end thereof and a cord guide eyelet at the other end thereof, an extending handle bar perpendicular to said rod, and two extending diverging prongs forming the cleat structure for receiving the cord therearound during adjustment of the ball height.

4,257,590

PORTABLE HOME GYMNASIUM

James L. Sullivan, Brea, and David S. Ryan, Capistrano Beach, both of Calif., assignors to Javier R. Ruiz, Newport Beach, Calif.

Filed Aug. 26, 1977, Ser. No. 827,879
Int. Cl.[3] A63B *21/06*
U.S. Cl. 272—117 **2 Claims**



1. An exercising device comprising:

a frame having a generally rectangular base, a pair of upstanding posts at each of opposite sides of said base and a generally rectangular upper member at the top of said posts, said posts being removably secured to said base and upper member;

cable guide means on said upper member between said pairs of posts and a movable weight cage having a pulley thereon below said cable guide means;

first pulley means hinged to said upper member, at opposite sides thereof, about a common transverse hinge axis;

second pulley means pivoted to said base, at opposite sides thereof substantially directly below said first pulley means and each being pivoted to said base about a generally vertical axis; and

an elongated cable having its mid-portion trained over said pulley on said weight case with its ends extending upwardly through said cable guide means, then laterally in opposite directions around said first pulley means and having hand engaging means at its ends, said cable ends being selectively extendable from said first pulley means to a user adjacent said frame or from said first pulley means then around said second pulley means to said user said posts of each pair being provided with a plurality of aligned openings therethrough a bar extending through aligned openings and having a weight supporting portion at one end.

4,257,591

ELONGATED EXERCISING DEVICE OF VARIABLE LENGTH

Kenzell Evans, Sr., 2320 Chester St. SE., #202, Washington, D.C. 20020

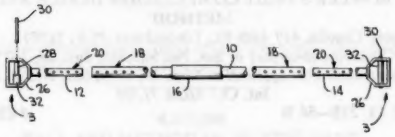
Filed Jul. 3, 1978, Ser. No. 921,185
Int. Cl.[3] A63B *21/00*
U.S. Cl. 272—125 **4 Claims**

1. An exercising device which comprises

a plurality of elongated sections which are interconnected to one another to form an elongated shaft of variable length, said sections including a hollow mid section and two end sections, said hollow mid section having a series of aligned holes extending through the distal ends thereof, and said end sections having a series of aligned holes extending therethrough, said end sections having cross-sectional dimensions less than the cross sectional dimension of said

mid section so as to be sideably positionable within a respective distal end of said mid section to vary the length of said elongated shaft;

pin members for interengaging the aligned holes in said end sections with respective aligned holes in said mid section so as to maintain the length of said elongated shaft at a fixed desired length, said pin members being T-shaped so as to have a top cross part and a base part, with the base part of each T-shaped pin member having a greater length than the diameter of said mid section such that when the base part of each T-shaped pin member is fitted through the aligned holes of said mid section and said end sections, said base part of each T-shaped pin member will extend outwardly beyond said sections, each said pin member



including a spring having one end attached to a top cross part of the respective T-shaped pin member and a second end connectable to the portion of the base part of the respective T-shaped pin member which extends beyond said sections when the respective T-shaped pin member is fitted through the aligned holes of said mid section and the respective end section; and

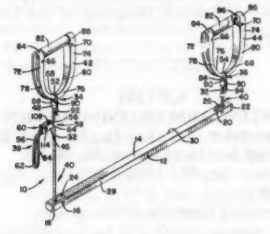
gripping means fixedly connected to the respective ends of said end sections which are remote from said mid section, each said gripping means comprising a generally D-shaped frame member and a separate rotatable gripping shaft mounted to extend internally of said generally D-shaped frame member and oriented so as to be perpendicular to the length of said elongated shaft.

4,257,592

EXERCISING APPARATUS WITH IMPROVEMENTS IN HANDLE STRUCTURE, ROPE ARRANGEMENT, AND CLAMPING MEANS

Arthur Jones, P.O. Box 1783, DeLand, Fla. 32720

Filed Nov. 29, 1978, Ser. No. 964,558
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—126 **15 Claims**



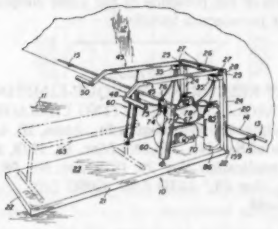
1. Handle for an exercising apparatus comprising a pair of spaced-apart side members, between which a hand may be inserted, with a bight member integral with and extending between intermediate portions of said spaced-apart side members, grip means extending between said side members adjacent free ends thereof, said handle including a plurality of grooves for retaining a rope loop received in selected positions thereon, when the grip means is oriented to different positions with respect to an exercise rope when the latter is in one of said selected grooves, with one of said grooves being located at the center of said bight member and at least one other of said plurality of grooves being located on one of said pair of spaced-apart side members adjacent the free end thereof and inboard of said grip means.

4,257,593

PNEUMATIC EXERCISING DEVICE

Dennis L. Keiser, Sanger, Calif., assignor to Keiser Corporation, Fresno, Calif.

Filed Dec. 20, 1977, Ser. No. 862,545
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—130 **14 Claims**



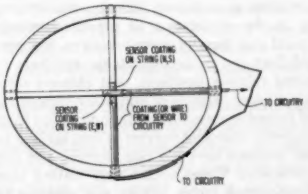
12. A pneumatic exercising device comprising a frame; a rigid member mounted on the frame for movement along a predetermined path of travel from and to a starting position by the application of muscular force during exercising; a source of gas; a pneumatic cylinder interconnecting the member and frame for extension and contraction along an axis by the exertion of muscular force against the member along a path substantially parallel to said axis of the pneumatic cylinder; a normally closed valve; means borne by the frame and operably connected to the normally closed valve for opening the normally closed valve when the member is in said starting position; and means interconnecting the source of gas, the normally closed valve and the pneumatic cylinder in series relation for supplying gas to the cylinder to resist movement of the member along said path of travel from the starting position by compression of said gas within the pneumatic cylinder and providing communication between the source of gas and the pneumatic cylinder through said normally closed valve when the member is in the starting position and preventing communication between the pneumatic cylinder and the source of gas through said normally closed valve when the member is moved from the starting position.

4,257,594

ELECTRONIC ATHLETIC EQUIPMENT

Richard N. Conrey, Ft. Lauderdale, Fla.; Phillip T. McQuaid, Towson, Md., and Paul J. Yursis, Timonium, Md., assignors to Richard N. Conrey, Ellicott City and Phillip T. McQuaid, Towson, both of, Md.

Continuation-in-part of Ser. No. 638,224, Dec. 5, 1975, Pat. No. 4,101,132. This application Jul. 17, 1978, Ser. No. 925,141
Int. Cl.³ A63B *61/00*
U.S. Cl. 273—29 A **19 Claims**


SENSOR COATING ON STRING (N,S)
TO CIRCUITRY
SENSOR COATING ON STRING (E,W)
COATING (OR WIRE) FROM SENSOR TO CIRCUITRY
TO CIRCUITRY

1. In combination,

an implement adapted to be entirely supported by hand and movable to strike a movable game element to impart

motion thereto, said implement comprising at least one area in which contact with the game element is intended to be made;

electrically conductive coating means applied to a portion of said at least one area for defining at least one conductor extending to at least one preselected location within said at least one area;

an electrical circuit including said at least one conductor;

means for detecting a change in the electrical properties of said circuit due to contact by the game element at said at least one preselected location; and

means responsive to said detecting means for providing an indication of the presence of the game element at said at least one preselected location.

4,257,595

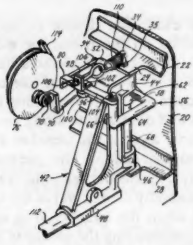
SELF-RESTORING, TORQUE-LIMITING, TORQUE-TRANSMITTING LINKAGE

LeRoy A. Steiger, 730 Washington St., Alton, Ill. 62002

Continuation of Ser. No. 885,543, Mar. 13, 1978, abandoned. This application Nov. 29, 1979, Ser. No. 98,652

Int. Cl.[3] A63D *5/02*; G05G *1/00*

U.S. Cl. 273—49 **6 Claims**



1. In a self-restoring, torque-limiting, torque-transmitting linkage which comprises a first rotatable member, a second rotatable member which can rotate with or relative to said first rotatable member, a pivot about which one of said rotatable members can rotate, and means to limit rotation of said one rotatable member to less than a full revolution, the improvement which comprises an elongated surface on said one rotatable member that is fixed and stationary relative to said one rotatable member and is directed so it is generally chordal relative to the path of rotation of said one rotatable member, an element which is secured to the other of said rotatable members and is movable relative to said one rotatable member and hence relative to said surface whenever said second rotatable member rotates relative to said first rotatable member, said surface having a length enabling it to engage said element even if said other rotatable member were held stationary throughout said rotation of said one rotatable member, a biasing member which continuously biases said element into engagement with said surface and which normally tends to hold a portion of said surface and a portion of said element adjacent each other and thereby normally tends to hold said first rotatable member and said second rotatable member in predetermined relative positions for rotation as a unitary linkage, said biasing member responding to the application of a predetermined value of torque to yield and thereby permit relative, independent rotation of said first and second rotatable members out of said predetermined relative positions, said element responding to relative independent rotation of said first rotatable member and said second rotatable member in either direction to move along said surface away from said portion of said surface and thereby increase the distance between said element and said pivot to increase restorative forces within said biasing member, said increased restorative forces urging said element back along said surface toward said portion of said surface regardless of the direction of relative independent rotation between said first rotatable member and said second rotatable member, said element and said surface permitting unimpeded movement of said element from either end of said surface toward said portion of said surface, said biasing member subsequently and automatically responding to said increased restorative forces and to the absence of said predetermined value of torque to cause said first rotatable member and said second rotatable member to re-occupy said predetermined relative positions and thereby again rotate as a unitary linkage, whereby said torque-limiting torque-transmitting linkage will automatically restore itself after each said relative, independent rotation of said first and second rotatable members.

4,257,596

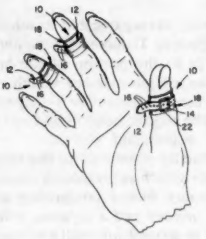
BOWLER'S DIGIT COMPRESSION DEVICE AND METHOD

Eugene Capella, 417 46th St., Lindenhurst, N.Y. 11757

Continuation-in-part of Ser. No. 809,555, Jun. 24, 1977, abandoned. This application Mar. 29, 1979, Ser. No. 25,110

Int. Cl.[3] A63B *71/04*

U.S. Cl. 273—54 B **3 Claims**



1. The method of reducing the knuckle portion of a bowler's digit prior to insertion thereof into a digit hole of a bowling ball for bowling, which method comprises:

(a) applying flexible non-extensible compression member means having a smooth inner surface on the knuckle portion of the digit so that said inner surface circumferentially completely overlies said knuckle portion;

(b) tightening said compression member means on said knuckle portion whereby said inner surface is in direct continuous compressive contact therewith; and

(c) increasing the tightening force on said compression member to cause diametrical reduction of the knuckle to a predetermined size.

4,257,597

BOWLING ARM TRAINING DEVICE

Richard W. Pennybaker, 122 Alsup La., Lavergne, Tenn. 37086

Filed Jul. 24, 1979, Ser. No. 60,203

Int. Cl.[3] A63B *69/00*

U.S. Cl. 273—54 B **4 Claims**

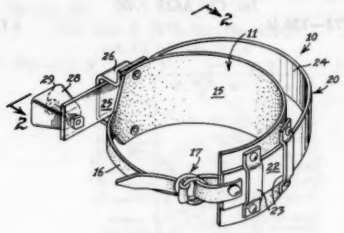
1. A sports training guide device comprising:

(a) a support member adapted to be detachably secured to the limb of a sports trainee, said support member having an inside portion and front and rear portions,

(b) a trigger member comprising a longitudinally curved elastic strap member having a front end fixedly mounted on the front end portion of said support member, and having a body contact portion normally disposed on the inside of the limb, extending around and spaced inward from said inside portion, and movable laterally outward toward the limb upon being engaged by an opposed body portion of the trainee during correct movement of the limb relative to the opposed body portion,

(c) a signal device cooperative with said trigger member,

(d) said elastic strap member terminating in a free rear end portion in cooperative relationship with said signal device



for actuation of said signal device when said body contact portion is moved laterally outward.

4,257,598

BALL AND METHOD OF MAKING SAME

Chester F. Massino, Sandwich, Ill., assignor to Ideas That Sell, Inc., Sheridan, Ill.

Continuation-in-part of Ser. No. 930,716, Aug. 3, 1978, abandoned. This application Jul. 9, 1979, Ser. No. 54,310

Int. Cl.[3] **A63B** *37/06, 37/12, 45/00*

U.S. Cl. 273—60 R **10 Claims**

1. A recreational ball comprising:

(a) A spherical center portion of cloth of uniform construction;

(b) yarn randomly wound about said center portion;

(c) adhesive tape covering said yarn; and

(d) a synthetic cloth cover;

said ball having the general appearance, size, shape and characteristics, particularly the aerodynamic characteristics, when thrown or hit of the conventional recreational ball it is meant to replace, but being softer and lighter.

4,257,599

SOCCER GAME TO BE PLAYED WITH MANUALLY MOVABLE PLAYER PIECES

Juan M. Cutri, 1312 Lovell Ave., Arcadia, Calif. 91006

Filed Oct. 5, 1979, Ser. No. 82,107

Int. Cl.[3] **A63F** *7/07*

U.S. Cl. 273—85 R **6 Claims**

1. In a soccer game to be manually played on a table, the combination comprising

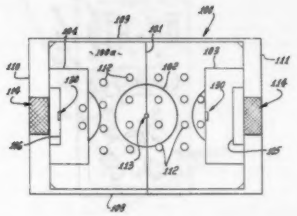
(a) a table top representative of a soccer field,

(b) generally disc shaped sliders representative of soccer players, the sliders positioned on the table top to slide therealong in response to finger flicking force application,

(c) a missile representative of a soccer ball, the missile being generally in cube form and having multiple sides and edges so that when struck by a moving slider, the missile will tumble in a generally linear direction and come to rest as a result of repeatedly striking the table top, the missile positioned on the table top,

(d) each slider having density and mass substantially in excess of the density and mass of the missile, and

(e) pockets on and spaced endwise of the table top and facing toward one another to represent soccer goal nets, there being multiple of such player sliders located on the table top, and other sliders in front of said pockets to represent goal tenders, said other sliders extending upright to higher



level than said missile, said other sliders being partially disc shaped and having flat peripheral surfaces engaging the table top, the flat peripheral surface of each of said other sliders intersecting the disc shaped surface of the slider, the overall length of that flat surface subtending an angle of between about 90° and 170° as respects the center of the otherwise circular slider.

4,257,600

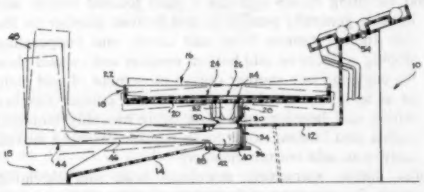
TILTABLE GAME TABLE WITH TIME CONTROLLED LOCKING MECHANISM

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356

Filed Feb. 2, 1979, Ser. No. 8,961

Int. Cl.[3] **A63F** *7/38, 7/02*

U.S. Cl. 273—110 **34 Claims**



33. A game apparatus in which one or more players attempt to cause a playing ball to roll into a goal area, said game apparatus comprising:

(a) a tiltable game playing board having an upper playing surface,

(b) a goal area in said playing surface for receiving a playing ball,

(c) manually operable control means operatively connected to said playing board to enable a player of the game apparatus to move the playing board in response to actuation of said control means so that the player can attempt to cause the ball to move into said goal area,

(d) a ball dispensing mechanism associated with said game board,

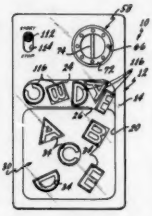
(e) means operatively connecting said ball dispensing mechanism and said goal area so that said ball dispensing mechanism automatically dispenses a playing ball after a previous playing ball has entered the goal area, and

(f) timing means and control locking means operatively connected to said timing means to automatically lock said manually operable control means after a predetermined time interval established by said timing means.

4,257,601
MANIPULATIVE GAME

Toshiaki Kurita, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Feb. 12, 1979, Ser. No. 11,216
Int. Cl.[3] A63B 7/00
U.S. Cl. 273—115 13 Claims



9. A game having a housing constructed so as to include a transparent cover, a bottom member located beneath and adjacent to said cover, and at least one object located within the space between said cover and said bottom member, said object being capable of being moved within said space during the utilization of said game in which the improvement comprises:

elevating means located within said housing and operatively associated with said bottom member for use in positioning said bottom member in either a play position in which said bottom member is spaced from said cover a sufficient distance so that said object can be moved within said space and a no-play position in which said object is clamped against movement between said cover and said bottom member, and

said bottom member is mounted within said housing so as to be capable of movement toward and away from said cover between said play and said no-play positions,

said elevating means includes a plate located within said housing generally parallel to said bottom member on the side thereof remote from said cover, and cooperating sloping surfaces on said bottom member and on said plate for engaging one another during movement of said plate so as to determine the position of said bottom member within said housing, said plate being movably mounted within said housing so as to be capable of being moved relative to said bottom member,

timer means operatively associated with said elevating means for actuating said elevating means so as to move said bottom member from said play position to said no-play position after a time interval determined by the operation of said timer means,

said timer means includes cam means engaging a portion of said plate serving as a cam follower so as to move said plate in order to cause said sloping surfaces on said plate and said bottom member to move with respect to one another so as to position said bottom member in said play position each time said timer means is actuated so as to be capable of releasing said portion of said plate so as to cause relative movement between said sloping surfaces so as to position said bottom member in said no-play position at the end of said interval,

said elevating means also including spring means connecting said housing to said plate for moving said plate when said portion of said plate is disengaged by said cam means,

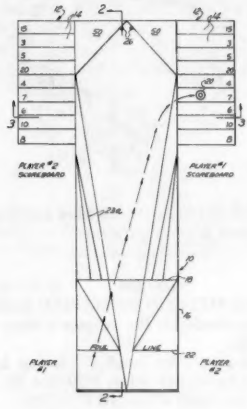
said housing including pocket adjacent to said cover and said space between said cover and said bottom member, said pocket being sufficiently large so as to receive and hold at least said object,

said bottom member in said no-play position serving to block the movement of said object from said pocket into said space between said cover and said bottom member.

4,257,602
ROLLING DISK GAME

Robert J. Seath, 303 Charbridge, Lapeer, Mich. 48446

Filed Sep. 25, 1978, Ser. No. 945,612
Int. Cl.[3] A63F 3/00
U.S. Cl. 273—126 R 4 Claims



1. A rolling disk game comprising:

a playing board having one end elevated above the other;

a pair of scoring boards each attached to a different side of the lower end of the playing board;

each of said score boards having a plurality of sectors with different magnitude score indicia on each;

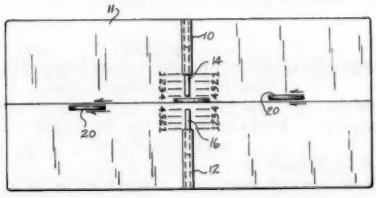
a rolling disk projectile operative to be rolled on its edge from the upper to the lower end of the playing board and then off the side of said playing board to a flat score indicating position on its disk surface on a respective score board; and

wherein each of said scoreboards has its outer edge distal from said playing board elevated to a raised position.

4,257,603
HOOP AND ADJUSTABLE TARGET GAME

Larry R. Harding, Box #112, Beaverville, Ill. 60912

Filed Jun. 7, 1979, Ser. No. 46,359
Int. Cl.[3] A63F 3/00
U.S. Cl. 273—126 R 5 Claims

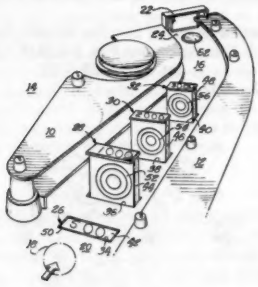


1. A game for use on the top surface of a table comprising a barrier secured to the surface of said table along a line across said surface, said barrier having two primary sections affixed to said table and spaced apart along said table line to provide a tabletop surface gap between said sections, said primary barrier sections having a pair of gate sections respectively slidably mounted thereto for selective incremental movement together along said line to narrow said gap, and a hoop adapted to be skidded and rolled through the gap between said gate sections.

4,257,604
IN-LINE DROP TARGETS

Irwin J. Grabel, Elmwood Park, and Glenn R. Andersen, Chicago, both of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Jun. 4, 1979, Ser. No. 45,139
Int. Cl.[3] A63B 71/00
U.S. Cl. 273—127 R 23 Claims



1. A play feature for use in a pinball machine having a playfield and at least one confined lane with an entrance, the play feature comprising;

a plurality of drop targets aligned in-line along the confined lane, each of the drop targets extending through an opening in the playfield and being movable between an up and a down position, each of the drop targets comprise a target body attached to the top of a support, the target body of each of the drop targets when in the up position extending above the playfield and being situated across and blocking substantially the entire lane whereby a ball traversing said lane must contact a first drop target in an up position prior to contacting any other drop target in an up position which is located behind said first drop target, and when in the down position allowing a ball rolling in the lane to freely pass;

means for releasably maintaining each of the drop targets in the up position until struck by a ball propelled up the lane;

resetting means for simultaneously raising the drop targets from the down position to the up position;

driving means for driving the resetting means in response to an electric signal being applied thereto; and

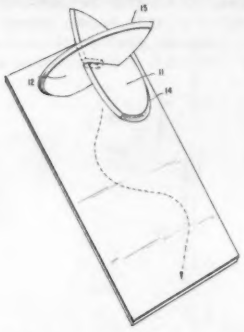
means for adjustably limiting the downward movement of each of the drop targets in the down position so that its top surface is in the same plane as a top surface of the playfield and thereby will not interfere with the roll of the ball.

4,257,605
ROLLABLE BODY

Donald G. Bancroft, R.R. #1 - Apt. 82, Macomb, Ill. 61455

Filed Oct. 15, 1979, Ser. No. 84,999
Int. Cl.[3] A63B 71/00
U.S. Cl. 273—128 A 10 Claims

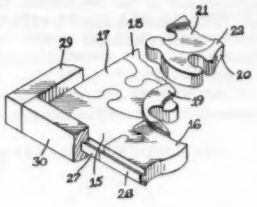
1. A rollable article consisting of two interconnected generally symmetrical sections of about equal weight which extend outwardly in diametrically opposite directions and each providing an outer supporting edge surface in the form of an arc having a length of about 180° with each supporting edge surface laying in separate intersecting planes which intersect one of said supporting edge surfaces midway between the ends thereof, and said article having no portion thereof providing support therefor other than said edge surfaces when the said article is placed on a planar surface; whereby said article exhibits a wobbling motion when rolled along an inclined planar surface.



4,257,606
THREE-DIMENSIONAL PUZZLE

Edward A. Launzel, 1501 Broadway, New York, N.Y. 10036

Filed Aug. 27, 1979, Ser. No. 70,253
Int. Cl.[3] A63F 9/12
U.S. Cl. 273—157 R 3 Claims



1. A single-ply puzzle of a desired sculptural subject comprising a plurality of matchable interior and border pieces each including integrally formed three-dimensional face areas to form an overall three-dimensional subject when all of said pieces are assembled, each of said interior and border pieces having a bottom wall for independent support on a tabular surface during assemblage thereon, each of said border pieces having a free border edge wall alignable with the free border edge walls of adjacent border pieces to form several sides of the puzzle when assembled, a securing strip for and to abut the aligned and adjacent free border edge walls of each of the sides of the puzzle as assembled to form an exterior peripheral framework therewith, and slideable interlocking means formed between each of said securing strips and the abutting border edge walls of corresponding sides of the puzzle for locking said assembled puzzle with and inside of said framework and for permitting slideable introduction of each of said strips to said corresponding sides along said tabular surface and without disturbing the assembled puzzle pieces thereon.

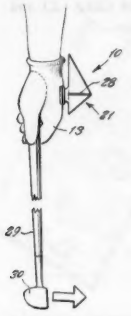
4,257,607
GOLF SWING GUIDES

Zygmund Nedwick, 32 Poplar Pl., Glen Cove, N.Y. 11542

Filed Jul. 23, 1979, Ser. No. 59,974
Int. Cl.[3] A63B 69/36
U.S. Cl. 273—183 B 1 Claim

1. A golf swing guide, comprising in combination, a base member and an indicator member detachably attachable together, and said base member including means for mounting

upon either a glove or upon a mid-riff site of a golf player; said means having the characteristic of permitting directional adjustability between said members, said indicator member including an arrowhead of triangular shape with a pointed spur at each side and an outwardly extending point to which said spurs are tapered, and one said spur being longer than the other.



4,257,608

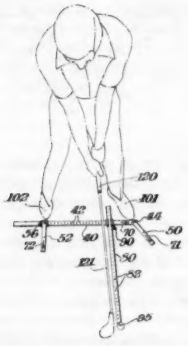
GOLFER'S SETUP DEVICE

Charles R. Funk, 5182 Avenida Primera, Tucson, Ariz. 85704

Continuation-in-part of Ser. No. 840,966, Oct. 11, 1977, abandoned. This application Jan. 12, 1979, Ser. No. 2,940

Int. Cl.[3] **A63B** *69/36*

U.S. Cl. 273—187 R **6 Claims**



1. A positioning device for a golfer, said device consisting essentially of

(a) an unslotted lateral scale strip about 30 to about 36 inches long and about 1¼ inches wide,

(b) two correspondingly narrow foot-aligning strips each at least about 8 inches long but not longer than about half the length of the lateral scale strip, one foot-aligning strip being pivotally secured near one end of the lateral scale strip and the other foot-aligning strip being slidably and pivotally mounted to slide along and pivot with respect to the lateral scale strip, the pivotal engagements requiring a definite effort to effect pivotal rotation and the mounting for the foot-aligning strips having a set of aligning indicators to show the inclination of those strips, and

(c) an unslotted perpendicular scale strip about as long and as wide as the lateral scale strip, the perpendicular scale strip being mounted for non-pivotal sliding along the lateral scale strip as well as for non-pivotal sliding and removal perpendicularly with respect to the lateral scale strip,

the lateral scale strip having an upper surface at least a six-inch length of which is free of scale markings to provide a space for inscribing notes.

4,257,609

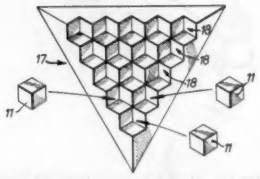
GAMES AND PUZZLES

Robert F. Squibbs, 41, Northwood Gardens, Greenford, London, England

Continuation-in-part of Ser. No. 942,682, Sep. 15, 1978, abandoned. This application Feb. 14, 1979, Ser. No. 12,211

Int. Cl.[3] **A63F** *9/12*

U.S. Cl. 273—241 **3 Claims**



3. Apparatus for use in performance of a game or puzzle, comprising a base and a set of play pieces, the play pieces comprising cubes of substantially equal size, and the base defining a plurality of recesses each arranged to seat a said play piece in such an orientation relative to the base that when the base is horizontal one of the internal diagonals of the play piece is substantially vertical; the base recesses being arranged in a triangular array such that when the recesses each seat a respective one of the play pieces, the seated play pieces together define further recesses which are substantially identical to those formed in the base and in which further of the play pieces can be seated to define together at least one additional further recess, the filling of all said base recesses and all said further recesses defined by seated play pieces resulting in the formation of a three-sided pyramid; each play piece cube having three mutually perpendicular faces marked with a first common identity and its other three faces marked with a second common identity whereby each piece can function as a piece of one or other of two players depending on which three faces with common identity face upper-most when the piece is seated in a said recess.

4,257,610

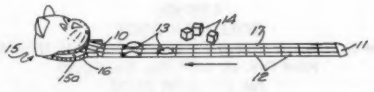
SNAPPING ANIMAL GAME

George W. Ptaszek, Elm St., P.O. Box 260, Pascoag, R.I. 02859, and Robert H. Hudson, 103 Valley St., Seekonk, Mass. 02771

Filed May 10, 1979, Ser. No. 37,856

Int. Cl.[3] **A63F** *3/00, 9/00*

U.S. Cl. 273—248 **4 Claims**



1. A game apparatus comprising in combination:

an elongated rectangular game board for a plurality of players,

a three-dimensional body, said body having a continuously movable opening,

a plurality of separate three-dimensional playing pieces one for each player,

said elongated rectangular playing board having a plurality

of sequential spaces constituting a playing path of incremental progress to be traversed by said playing pieces, means for randomly determining the amount of incremental advance of said playing pieces along said playing path, means for continuously retracting said elongated rectangular playing board into said opening at a substantially uniform speed sufficiently slow to permit a series of manual advances of said pieces in response to said random means.

4. A method of playing a game involving a facsimile animal with a defined movable mouth, a plurality of playing pieces, each under control of a respective player, and an elongated game board having a path with a plurality of spaces, said method including the steps of advancing each said playing piece under control of its respective player along said path incrementally in response to an arbitrarily determined number, retracting said game board continuously during the course of said game, opening and closing of said animal's mouth simultaneously with the retraction of said game board.

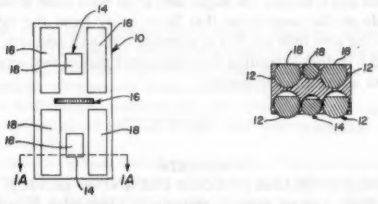
4,257,611
DOMINOES WITH CONCEALABLE SPOTS

John N. Schmitz, Sr., 3324 N. Stanton, El Paso, Tex. 79902, assignor to Schmitz, Sr., John Nathaniel; Wanda Lee Wilcoxon Schmitz; Cynthia Elaine Schmitz and Rebecca Lee Schmitz McKenzie, all of El Paso, Tex.

Filed Aug. 16, 1979, Ser. No. 65,833

Int. Cl.³ A63F *9/20*

U.S. Cl. 273—293 **3 Claims**



1. A domino comprising a body having two major opposed flat surfaces, means for causing domino indicia to be selectively displayed in the plane of each of said surfaces, said means including means for ensuring that when said domino indicia are displayed on one of said surfaces no domino indicia are displayed on the other of said surfaces.

4,257,612
OPTOELECTRONIC AMUSEMENT DEVICE

Alvaro J. Villa, Northridge, Calif., assignor to Walt Disney Productions, Burbank, Calif.

Continuation-in-part of Ser. No. 718,369, Aug. 27, 1976, Pat. No. 4,150,824. This application Dec. 13, 1978, Ser. No. 968,910

The portion of the term of this patent subsequent to Apr. 24, 1996, has been disclaimed.

Int. Cl.³ F41J *5/08;* **A63F** *9/02*

U.S. Cl. 273—310 **2 Claims**

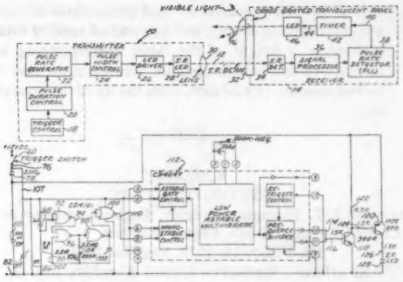
1. An optoelectronic transmitter means for use in an amusement park shooting gallery, said transmitter means emitting infrared energy and being mounted in a firearm replica, said transmitter means including:

transducer means for converting electrical input energy into infrared energy, said transducer means being mounted in said replica to emit said infrared energy along a barrel of said replica;

lens means mounted in said barrel for focusing said infrared energy into a narrow beam which emanates from said barrel;

pulse generating means for generating electrical input energy including frequency gating means for gating pulses at a predetermined pulse rate of at least about 1800 hertz frequency to said transducer means, said pulse generating means being selectively enabled by a manual trigger signal, said pulse generating means including a monostable multivibrator triggered by an oscillator; and

pulse train duration control means connected to said pulse generator means for operating said pulse generator means only for a predetermined time duration, said pulse train



duration control means including a resistor-capacitor timing circuit with its output connected to the inputs of a NOR gate, the output of the NOR gate being connected to said pulse generator means whereby the charging of said capacitor to a predetermined voltage causes said NOR gate to change state.

4,257,613
DART AND DARTBOARD THEREFOR

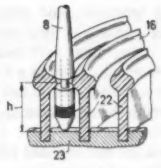
Peter Meyer Thor Straten, 54, Breitenburgerstrasse, D-2210 Itzehoe, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 812,701, Jul. 5, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,211

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1977, 2702502

Int. Cl.³ A63B *65/02;* **F41J** *3/00*

U.S. Cl. 273—347 **2 Claims**



1. A dart game consisting essentially of a dart comprising

(a) a cone-shaped nose part having a base and a rounded tip,

(b) a tail part bearing fins,

(c) a stem part connecting said tail part with the base of said nose part, and

(d) a ballast member mounted on said stem part intermediate said tail part and said nose part and in contact with said tail part, the distance between said tail part and nose part and the length of said ballast member, along said stem part, being so adjustable relative to one another that said length of the ballast member is shorter than said distance, said ballast member thereby being shiftable during flight from its position adjacent said tail part toward said nose part, and thereby producing an annular groove about said stem part between said ballast member and said tail part;

and a dartboard comprising

(α) a base part having a front face,

(β) a layer of dart-holding projections on said front face, each of said projections protruding substantially at right angle from said front face and being elastically flexible and

deflectable by the nose part of said dart when the latter penetrates into said layer, and

(γ) engagement means on both said dart and said projections, said engagement means of said dart being adapted for engaging said engagement means of at least two of said projections when said dart has penetrated said layer and the blunt tip of said nose part is at or near said front face, said engagement means of said projections comprising annular beads at or near the free end of each of said projections at a height of the latter corresponding to the distance of said annular groove, formed at the rear of the ballast member of said dart, from the tip of the nose of said dart.

4,257,614

RECORD PLAYERS

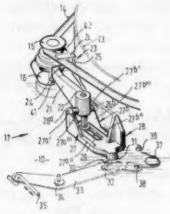
Raymond J. T. Thompson, Sedgley, England, assignor to BSR Limited, Cradley Heath, United Kingdom

Filed Mar. 15, 1979, Ser. No. 20,706

Claims priority, application United Kingdom, Sep. 2, 1978, 5183/78

Int. Cl.³ G11B *3/60*

U.S. Cl. 369—267 **4 Claims**



1. A speed changing mechanism for a record player of the type having a deck plate, a turntable rotatably mounted on said deck plate, a motor driven pulley, and a belt rotatably coupling said pulley and said turntable, said pulley having first and second belt engaging surfaces of first and second diameters, when said belt is in engagement with said first belt engaging surface, said turntable being driven at a first speed, when said belt is in engagement with said second belt engaging surface of said pulley said turntable being driven at a second speed, the improvement comprising:

a belt engaging arm for moving said belt between said first and second surfaces of said pulley;

said arm being mounted on said deck plate for pivotal movement about an axis parallel to and spaced apart from the axis of rotation of said pulley and for axial movement along said axis of said arm;

a drive member mounted on said deck plate for sliding movement in a plane transverse to said arm axis between first and second predetermined positions;

manually operable means connected to said drive member to move said drive member between said first and second pre-determined positions;

first and second cam followers on said arm and first and second cam surfaces on said drive member, said cam followers on said arm and said cam surfaces on said drive members being in direct operative engagement, said first cam surface causing axial movement of said arm in a second direction, movement of said drive member from said first predetermined position to said second predetermined position causing said arm to move said belt first transversely outwardly of said pulley, thereafter along a path parallel to the axis of said pulley, then transversely inwardly of said pulley.

4,257,615

TONE ARM

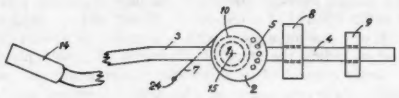
Hans H. Morch, Skovvej 16, 2820 Gentofte, Denmark

Filed May 22, 1979, Ser. No. 41,436

Claims priority, application United Kingdom, May 26, 1978, 23508/78

Int. Cl.³ G11B *3/10*

U.S. Cl. 369—244 **11 Claims**



1. Tone arm of the type in which there is an arm tube or -rod carrying the phono cartridge and a counterweight arm carrying a counterweight which arms are hold by a separate element which moves with said arms and which is attached to the suspension which is again attached to the non moveable part of the tone arm and in which tone arm the said counterweight arm is attached to the lower part of said separate element below the said suspension and facing away from the direction to which the arm tube or -rod is pointing out, characterized in that the suspension around which the moveable part of the arm is moving is placed eccentrically with respect to the center of gravity of the said separate element which is made of solid material and is having the major part of its mass close to and on the side of the suspension that faces away from the side to which the arm tube or -rod is pointing out, and said arm tube or -rod is further extending from the upper part of said separate element above the suspension.

4,257,616

PHONOGRAPH RECORD CLEANING DEVICE

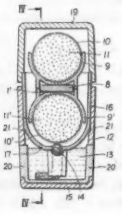
Ernst Pless, Vienna, Austria, assignor to Viennaplex Fabrik für Kunststofferzeugnisse Ernst Pless KG, Austria

Filed Feb. 28, 1979, Ser. No. 16,073

Claims priority, application Austria, May 22, 1978, 3694/78

Int. Cl.³ G11B *3/58*

U.S. Cl. 15—230 **5 Claims**

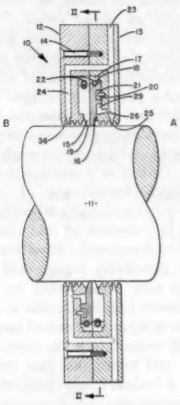


1. A cleaning device for phonograph records comprising an elongated grip member, an elastic cylinder, means for rotatably mounting said elastic cylinder to said grip member parallel to the length thereof, pressure means operatively connected to said grip member for providing a selected bearing pressure on a record to be cleaned sufficient for cleaning the record, cleaning means for engaging the record to be cleaned carried on said elastic cylinder including a portion for cleaning a record, said cleaning means being movable responsive to rotation of said elastic cylinder to vary the portion used for cleaning the record, and said grip member has first and second oppositely facing troughs, and said elastic cylinder comprises a cylindrical member in each of said troughs.

4,257,617
SHAFT SEAL ASSEMBLY

M. Raymond Hill, Irwin, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 6, 1978, Ser. No. 958,295
Int. Cl.[3] F16J 15/40
U.S. Cl. 277—3 8 Claims



1. A shaft seal assembly for a rotary machine, wherein a process fluid contained within a relatively high pressure region of the rotary machine is prevented from escaping to surrounding regions of relatively lower pressure, comprising:

first seal means encompassing the rotary shaft in a spaced relationship to provide a first fluid flow restriction along the shaft,

second seal means including a plurality of circumferentially extending segments also encompassing said shaft for providing a further flow restriction along the shaft and including means for generating a first force of a predetermined magnitude for maintaining the segments of said second seal means in contact sealing engagement with said shaft and means responsive to fluid pressure for opposing said means for generating a first force to move the segments of said second seal means out of contact sealing engagement with said shaft, and

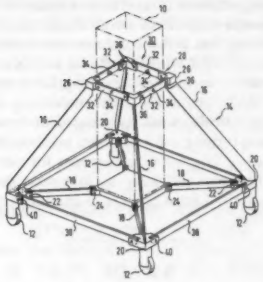
conduit means for delivering a fluid to said first and second seal means and including a first fluid path means for delivering fluid to said first seal means wherein fluid is discharged into said first fluid flow restriction to act as a buffer fluid to prevent said process fluid from passing from the high pressure region to the surrounding region and second fluid path means for delivering a portion of said delivered fluid to said means responsive to fluid pressure whereby as the pressure of said delivered fluid is increased said first seal means becomes more effective and the segments of said second seal means are moved out of contact sealing engagement.

4,257,618
TERRAIN-ADAPTABLE SUPPORT STRUCTURE

Hans Tax, Potsdamer Strasse 3, D-8000 Munich, Fed. Rep. of Germany; Klaus Hösler, Eichenau, and Dieter Bauer, Munich, both of Fed. Rep. of Germany, assignors to Hans Tax, Munich, Fed. Rep. of Germany

Filed Jul. 25, 1979, Ser. No. 60,591
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834301; Nov. 30, 1978, 2851859
Int. Cl.[3] B62D 49/08
U.S. Cl. 280—6.11 23 Claims

1. A support structure for a mobile construction rig capable of adapting to uneven terrain comprising four support bearing members arranged at least approximately in a quadrilateral formation, said bearing members being arranged with bearing points which lie in a common reference plane when said structure is on flat terrain, said structure being configured to permit movement of said bearing members in a vertical direction relative to said reference plane and to couple said bearing members with each other in such a manner that when a first of said four bearing members is moved vertically relative to said reference plane, a second of said bearing members located

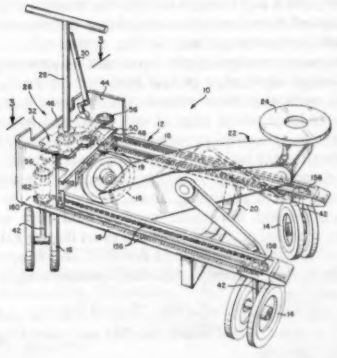


diagonally opposite said first bearing member is deflected relative to said reference plane in the same direction and by approximately the same distance as said first bearing member, with the third and fourth bearing members of said four bearing members being both deflected relative to said reference plane in a direction opposite to the direction in which said first and second bearing members are deflected and by approximately the same distance.

4,257,619
VARIABLE RATIO ROTARY POSITIONING MECHANISM AND CAMERA DOLLY STEERING MECHANISM EMBODYING SAME

James L. Fisher, 10918 Burbank Blvd., North Hollywood, Calif. 91601

Filed Sep. 26, 1978, Ser. No. 945,887
Int. Cl.[3] B62D 7/06
U.S. Cl. 280—91 18 Claims



1. A steering mechanism for a dolly such as a camera dolly having a frame, a first pair of wheels at one end of said frame, a second pair of wheels at the other end of said frame, means supporting each wheel on said frame for steering rotation of the wheel relative to the frame, and a rotatable steering shaft on said frame, said steering mechanism comprising:

adjustable ratio transmission means drivably coupling said steering shaft and said first wheels for steering rotation of

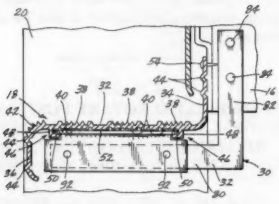
said first wheels by said steering shaft with a turning ratio equal to the wheel steering rotation angle per unit steering shaft rotation angle, and second interwheel transmission means selectively coupling said second wheels to said first wheels for steering rotation of said second wheels with said first wheels and locking said second wheels against steering rotation relative to said frame, and said adjustable ratio transmission means comprising endless flexible drive band means coupling said steering shaft to said first wheels for steering rotation of said first wheels by said steering shaft through said drive band means, said drive band means having first and second runs between said steering shaft and each first wheel shaft and said runs being laterally adjustable to increase the length of either run and decrease the length of the other run during steering rotation of said wheels by said steering shaft in such a way as to vary said turning ratio between said steering shaft and the respective first wheel, and means for laterally adjusting said first and second runs in unison during and at different selected rates relative to the turning rate of said steering shaft.

4,257,620

RUNNING BOARD AND METHOD FOR ASSEMBLING SAME

Merlyn C. Okland, 204 West Broad St., Story City, Iowa 50248

Filed Nov. 9, 1978, Ser. No. 958,900
Int. Cl.³ B62B 9/16
U.S. Cl. 280—153 R **14 Claims**



1. A running board for a vehicle having a front wheel well, a horizontal body portion extending rearwardly from said wheel well, and a cab frame; said running board comprising:

an elongated board member comprising in cross section a central horizontal portion having opposite longitudinal edges, an upper vertical portion extending upwardly from one longitudinal edge of said horizontal portion, and a lower vertical portion extending downwardly from the opposite longitudinal edge of said horizontal portion;

means for securing said upper vertical portion of said board member to said horizontal portion of said vehicle;

said horizontal portion of said board member having first securing means extending downwardly from the under surface of said horizontal portion, said first securing means comprising, a pair of spaced apart flanges extending downwardly from said board member, said spaced apart flanges having inwardly projecting lips extending towards one another;

at least one transverse member positioned below said horizontal portion of said board member and extending transversely thereof;

said transverse member having an elongated vertical plate portion and a horizontal key portion integrally formed with said vertical plate portion, said horizontal key portion being elongated and having a pair of outwardly projecting lips at the opposite longitudinal ends thereof, said outwardly projecting lips forming second securing means, in retentive engagement with said inwardly projecting lips of said flanges for attaching said transverse member to said board member in fixed relation thereto;

means for opeatively connecting said transverse member to said cab frame.

13. A method for assembling a running board for vehicles having a front wheel well, a horizontal body portion extending rearwardly from said front wheel well, and a body frame, said method comprising:

forming an elongated board member comprising in cross section a central horizontal portion having opposite longitudinal edges, an upper vertical portion extending upwardly from one longitudinal edge of said horizontal portion, a lower vertical portion extending downwardly from the opposite longitudinal edge of said horizontal portion, and a pair of lip flanges each extending downwardly and transversely from the bottom surface of said horizontal portion to provide a key way therein;

securing at least one transverse member to the bottom of said horizontal portion in a position wherein said transverse member extends transversely of said horizontal portion, said securing being accomplished by press fitting into said key way a key portion of said transverse member sized and shaped to frictionally fit within said key way so as to frictionally retentively engage said lip flanges,

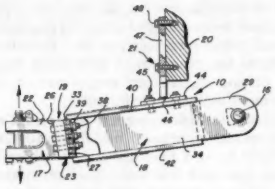
accomplishing said press fitting by positioning said key portion between said lip flanges in a preparatory position wherein said longitudinal axis of said transverse member is oblique with respect to a line transverse to the longitudinal axis of said board member, rotating said transverse member to a locked position wherein said key portion is disposed transversely with respect to said longitudinal axis of said board member and is forced into frictional retentive engagement with said lip flanges of said key way.

4,257,621

VEHICLE HITCH AND DRAWBAR ASSEMBLY

Carl P. Adams, Metamora, and Robert D. Roley, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 8, 1979, Ser. No. 10,339
Int. Cl.³ B60D 1/02
U.S. Cl. 280—495 **11 Claims**



1. A hitch and drawbar assembly **(10)** comprising:

a drawbar **(18)** having a longitudinally extending mounting portion **(28)** for attachment to a vehicle **(11)** to transmit a longitudinal pulling force therethrough and a transversely extending connection portion **(33)**;

means **(21)** for supporting the drawbar in a vehicle with said mounting portion extending at a small angle to the horizontal with said mounting portion lowermost;

a hitch **(17)** having a longitudinally extending clevis portion **(22)** and a securing portion **(23)** complementary to said drawbar connecting portion; and

securing means **(38)** extending through said drawbar connecting portion and hitch securing portion in the direction of said longitudinal pulling force and at said small angle to the longitudinal extent of said clevis portion, said securing means securing the hitch to the drawbar to cause said securing means to be placed primarily in tension by the pulling force.

7. In a vehicle **(11)** having a frame **(12)** and a wall element **(20)** carried by the frame, an improved hitch and drawbar assembly **(10)** comprising:

pin means **(15,16)** mounting a portion of the drawbar to the

vehicle frame, said pin means defining a horizontal axis extending transverse to the frame; and

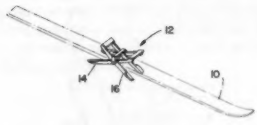
support means (21) supporting the drawbar (18) on the wall element against pivoting about said pin means axis, said support means permitting limited relative movement between the drawbar and said support means radially of said pin means axis to cause substantially all longitudinal pulling forces developed in said drawbar in use of the assembly to be taken by said pin means, said support means further permitting limited relative movement between the drawbar and said support means at a small angle to a perpendicular to said permissible radial movement.

4,257,622

SKI STOP ASSEMBLY

Gunther Mittermaier, Tahoe City, Calif., assignor to Anthony P. Manino, San Mateo, Calif.

Filed Dec. 19, 1978, Ser. No. 971,020
Int. Cl.³ A63C 7/10
U.S. Cl. 280—605 **6 Claims**



1. A ski stop assembly for impeding the sliding movement of a ski upon release of said ski from a skier's boot, comprising:

(a) a pair of elongated members of the same given length substantially greater than the thickness of said ski, each of said pair of elongated members having first and second flanges projecting laterally therefrom in opposite directions at opposite ends thereof with the portions of each of said pair of elongated members intermediate said first and second flanges being rectilinear and with each elongated member having an aperture therethrough at the same given point intermediate said first and second flanges;

(b) means for mounting said pair of elongated members on a side of said ski with said first flange of each of said pair of elongated members extending over the top of said ski for engagement by the bottom of a skier's boot and said second flange of each of said pair of elongated members extending away from said side of said ski, said means for mounting said pair of elongated members including an axle extending normally to the axis of the elongation of said ski, a first mounting member extending contiguously along the side of said ski spaced from the bottom surface of said ski and having an aperture therethrough normal to the axis of elongation of said ski and a second mounting member extending along the side of said ski spaced from the bottom surface of said ski and overlapping said first mounting member; said second mounting member being spaced from said first mounting member laterally of the axis of elongation of said ski and having an aperture therethrough normal to the axis of elongation of said ski in registry with said aperture through said first mounting member; said pair of elongated members being sandwiched between said first and second mounting members with said apertures therethrough in alignment with each other and with said aperture through said first and second mounting members; and said axle member being received in said apertures through said first mounting member, said pair of elongated members and said second mounting member to enable rotation of said elongated members in opposite directions with respect to each other about a common axis between a first position in which said first flanges of said pair of elongated members are spaced above the top of said ski with said second flanges projecting below the bottom of said ski and a second position in which said first flanges of said pair of elongated members are substantially in contact with the top of said ski with said second flanges in substantial alignment with the side of said ski;

(c) a torsion spring received about said axle and between said pair of elongated members, said torsion spring urging said pair of elongated members to rotate in opposite directions about said common axis of said axle toward said first position thereof with respect to said ski; and

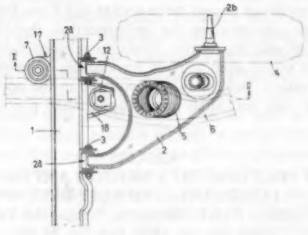
(d) means for stopping rotation of said pair of elongated members toward said first position thereof with said elongated members extending at an angle to the axis of elongation of said ski.

4,257,623

SUPPORTING STRUCTURE FOR A SUSPENSION MEMBER FOR A VEHICLE

Mitsuo Kawase, and Hiroyuki Watanabe, both of Toyota, Japan, assignors to Toyoda Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 23, 1979, Ser. No. 41,881
Claims priority, application Japan, Jun. 2, 1978, 53-75847[U]
Int. Cl.³ B60G 7/00
U.S. Cl. 280—660 **5 Claims**



1. A supporting structure for a transversely extending suspension member on a vehicle, comprising a trailing arm pivotally connected to said suspension member and connected to a wheel of said vehicle, a front cushion and a rear cushion which resiliently support said suspension member on the body of said vehicle, said front cushion having a small spring rate against a load acting longitudinally on said vehicle and a vertical load on said vehicle, and said rear cushion having a large spring rate against said vertical load, wherein said rear cushion is horizontally positioned closer to the pivot point between said suspension member and said trailing arm than is said front cushion.

4,257,624

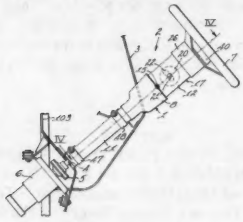
EXTENDIBLE STEERING COLUMN

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1978, Ser. No. 972,464
Int. Cl.³ B62D 1/18
U.S. Cl. 280—775 **10 Claims**

1. A steering mechanism for a vehicle having a firewall, and a steering valve and motor on the outside of said firewall, said mechanism comprising: a lower steering column portion fixedly mounted to extend through said firewall; a lower steering shaft portion rotatably mounted within said lower column portion and adapted to control said valve and motor; an upper steering column portion; means for pivotally mounting said upper column portion to said lower column portion for pivotal movement between a plurality of pivotal positions; means for

manually locking said upper column portion in a selected one of said plurality of pivotal positions; an upper steering shaft portion rotatably mounted within said upper column portion; a universal joint connecting said upper and lower shaft portions about said pivotally mounting means; a quill shaft rotatably and slidably mounted in said upper column portion concentric to said upper shaft portion; a steering wheel fixed to said quill shaft; and means for releasably locking said upper shaft portion to said quill shaft whereby said steering wheel can be slidably adjusted between a plurality of operative positions, said releasibly locking means including cam means on said upper shaft



portion, a reciprocating cam element mounted within said quill shaft, reciprocal movement of said cam element causing said cam means to force said cam element radially into engagement with said quill shaft for locking said upper shaft portion to said quill shaft, a cap rotatably mounted relative to said steering wheel, an elongated drive socket in said cap, and a screw member received in said drive socket and threadedly engaged with said cam element for reciprocation thereof whereby rotation of said cap in one direction releases said quill shaft from said upper shaft portion for slidable adjustment of said steering wheel, and rotation of said cap in the opposite direction locks said quill shaft to said upper shaft portion.

4,257,625

INPUT COUPLING TO A MOTION AMPLIFIER FOR USE IN DOOR-ACTUATED SEAT BELT SYSTEMS

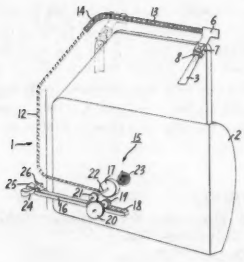
Juichiro Takada, 3-12-1, Shinmachi, Setagayaku Tokyo, Japan

Filed Apr. 23, 1979, Ser. No. 32,340

Claims priority, application Japan, Oct. 31, 1978, 53/133241; Nov. 17, 1978, 53/141062; Dec. 25, 1978, 53/176000[U]

Int. Cl.[3] B60R *21/10*

U.S. Cl. 280—804 **8 Claims**



1. In a passive occupant restraint belt system for vehicles having a body and a door, the system including a restraining belt, apparatus for moving the belt from an occupant-restraining to an occupant-releasing position in response to partial opening of the door of the vehicle comprising belt transfer means engaging the belt for moving the belt from the restraining to the releasing position and motion transmission means coupled to the belt transfer means for transmitting and amplifying opening motions of the door to the transfer means, the transmission means including a motion amplifier mounted on one of the vehicle body and door, and a force transmitting input member having one end coupled to an input component of the motion amplifier, the improvement comprising coupling means for connecting the other end of the input member to the other of the vehicle body and door when the door is between closed and partway opened positions for transmitting door opening and closing movements to the motion amplifier to move the belt between its restraining and releasing positions, and for releasing the other end of the member from the door or vehicle body when the door is between partway opened to fully opened.

4,257,626

DEVICE FOR TIGHTENING A SAFETY BELT FOR A MOTOR VEHICLE

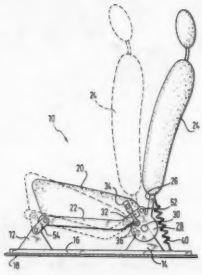
Heinz D. Adomeit, Berlin, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Mar. 7, 1979, Ser. No. 18,227

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1978, 2810231

Int. Cl.[3] A62B *35/00*; B60R *21/10*

U.S. Cl. 280—806 **8 Claims**



1. Device for tightening a safety belt about a person in a seat mounted on a vehicle body of a motor vehicle in which a belt anchor is attached to the vehicle, the improvement comprising said belt anchor supported movably relative to the vehicle body, and said belt anchor coupled to a mass of a vehicle part which is arranged movably so as to execute a forced motion relative to the vehicle body if the vehicle hits an obstacle; and wherein said seat has a tiltably supported seat back frame which constitutes at least part of said mass, and wherein the belt anchor is linked-on to the lower part of the tiltably supported seat back frame; and wherein the mass is spring-loaded against motion relative to the vehicle body.

4,257,627

CONTINUOUS BUSINESS FORM

Robert H. Allen, North Tonawanda, N.Y., and Alan M. Gould, Wassenaar, Netherlands, assignors to Moore Business Forms, Inc., Grand Island, N.Y.

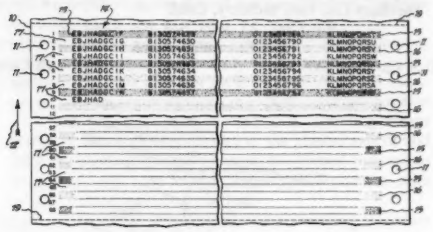
Continuation-in-part of Ser. No. 916,414, Jun. 16, 1978, which is a continuation of Ser. No. 619,466, Oct. 3, 1975, which is a continuation of Ser. No. 560,479, Mar. 20, 1975, which is a continuation of Ser. No. 387,447, Aug. 10, 1973, abandoned. This application May 7, 1979, Ser. No. 36,491

Int. Cl.[3] B42D *15/00*

U.S. Cl. 283—66 R **2 Claims**

1. In a continuous business form having a surface adapted to be imprinted with characters of a predetermined size, said form having lines of weakening whereby said form may be subdivided into uniform sets having rows of feed holes extending along at least one side margin thereof, a plurality of continuous parallel bars of at least three different and unlike colors, one of which is lighter than the other two colors, said bars occupying

a substantial part of said area of said surface with individual ones of said bars extending across said form for the optional printing of characters across substantially all of the width of said bars in random manner; said bars having a dimension of at least equal to but not less than twice the height of said characters so that a single line of characters may be printed on said bars, said bars being spaced repetitively along said form in such



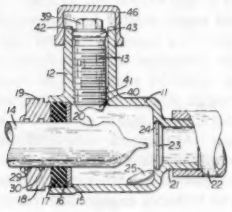
manner so that said lighter color bars are spaced alternately and any sequence of said bars includes bars of at least three different colors whereby a line of characters printed on one bar will be clearly distinguishable from lines of characters printed on adjoining bars on said surface of said form, an improvement in said form comprising wherein said colored bars comprise at least two darker colors and a third color bar which is a blend of the two darker colors.

4,257,628

PIPE CONNECTOR AND HOLE CUTTER

Robert E. Petersen, R.R. 1 Box 254, Walcott, Iowa 52773

Filed Mar. 10, 1980, Ser. No. 129,251
Int. Cl.³ F16L *41/06*
U.S. Cl. 285—3 **4 Claims**



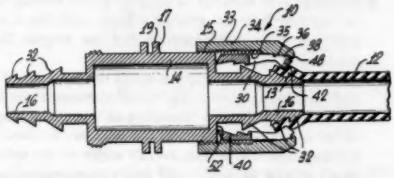
1. A pipe connector and pipe hole cutter comprising:
a hollow body to enclose an end of a first pipe, said end being closed and said pipe containing fluid under pressure, said hollow body having an open input end to be placed about said end of said first pipe and an opposite output end terminating in a pipe coupling to which a second pipe is to be connected,
a collar and a seal adapted to embrace said first pipe and to be connected to said input end of said hollow body, fastening means between said collar and said body to be tightened for positioning rigidly a substantial length of said end of said first pipe within said body and for providing a fluid seal between said first pipe and said end of said body,
said body having a lateral tubular extension for receiving said pipe hole cutter, said pipe hole cutter being contained within said extension and having a cutting end facing an adjacent portion of said first pipe, sealing means disposed between said pipe cutter and said extension to prevent flow of fluid through said extension, said cutter being movable inwardly directly toward said first pipe to cut a hole through the wall thereof and then movable outwardly to leave said hole unobstructed, said extension being positioned at a predetermined distance from said one end of said body to cut said hole close to an inner side of said collar and seal, and
said body having its inner wall spaced from said first pipe at least in the area about said hole and along a line to said pipe coupling to provide sufficient passageway for fluid to flow freely from said hole to said pipe coupling.

4,257,629

FLEXIBLE CONDUIT REPAIR COUPLING

Steven E. Maple, Claremont, and Enric C. Mendoza, Baldwin Park, both of Calif., assignors to Rain Bird Sprinkler Mfg. Corp., Calif.

Filed May 1, 1978, Ser. No. 901,528
Int. Cl.³ F16L *25/00*
U.S. Cl. 285—12 **19 Claims**



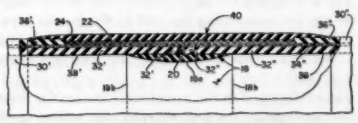
1. A repair coupling for flexible conduits comprising:
a body portion including at least one nipple projecting therefrom, said nipple arranged to be received within the end of a flexible conduit;
a reversible collapsible collet coaxially surrounding said conduit and nipple when said nipple is received within the end of the conduit, and arranged to be disposed in a first position wherein a first means for grippingly engaging said conduit is located on a first end of said collet and cooperates with a first size of conduit, and in a second, oppositely facing, position wherein a second means larger than said first means for grippingly engaging said conduit is located on a second end of said collet and cooperates with a second, larger size of conduit; and
a retaining nut coaxially surrounding said collet and threadably received on said body portion for collapsing said collet into sealing engagement with the end of said conduit and said conduit into sealing engagement with said nipple when said conduit is received over said nipple.

4,257,630

METHOD AND APPARATUS FOR SPLICING HOSE

Jeffrey M. Bartell, Rome, N.Y., and Robert V. D'Elia, Canton, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 927,717, Jul. 25, 1978, Pat. No. 4,204,897.
This application Oct. 1, 1979, Ser. No. 80,755
Int. Cl.³ B32B *3/00*
U.S. Cl. 285—21 **6 Claims**



1. A splice for joining two segments of hose the ends of which are in abutting relationship to form a juncture therebetween, said hose comprised of an inner elastomeric liner tube, at least one ply of a reinforcement fabric, and an elastomeric cover, the cover being removed for a length L from each of the ends to expose the reinforcement fabric, said splice comprising:

an annulus of sealing elastomer mounted in the hose bore at the juncture of the abutted ends and having an inner convex surface depending radially into the bore of the hose, the inner surface presenting a smooth tapered configuration to the hose bore with the greatest thickness of the elastomer being at the location of the juncture of the hose ends and tapering in either direction away from the juncture, the outer surface of the sealing elastomer being cylindrical and having a circumference substantially equal to the hose bore circumference such that the cylindrical surface is in mating relationship with the bore, the length of the cylindrical surface being greater than the gap across the juncture to thus seal the juncture between the two hose ends;

a length of elastomeric tube stock filling the juncture of the abutted hose ends for the thickness of the hose liner tube plus the thickness of the hose reinforcement;

a reinforcement material of a textile fabric having elastomer on both surfaces to provide a bond with the existing underlying hose reinforcement for the length 2L of the exposed hose reinforcement; and

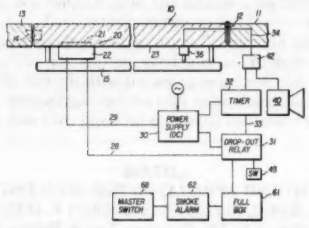
an elastomeric cover wrapped about the juncture of the hose ends, completely covering the reinforcement textile fabric for the length 2L and extending an additional length L' in either direction away from the juncture to overwrap the existing hose cover, the overall width of the splice cover being at least 2L+2L'; said splice components being vulcanized into an integral structure with the existing hose materials.

4,257,631

MAGNETIC EMERGENCY EXIT DOOR LOCK WITH DELAYED OPENING

Emanuel Logan, Jr., Silver Spring, Md., assignor to Reliable Security Systems, Inc., Columbus, Ohio and Reliable Security Systems, Inc., Columbus, Ohio

Filed Jun. 25, 1979, Ser. No. 51,724
Int. Cl.³ E05C *17/56*
U.S. Cl. 292—251.5 **7 Claims**



1. A locking system for a door of an enclosure comprising:

magnetic means for locking the door in a closed condition, wherein the magnetic means includes a coil and an armature, one of which is mounted on the door and the other of which is mounted on the enclosure;

a power supply for supplying current to the magnetic means,

means for connecting the coil to the power supply wherein, when power from the power supply is supplied to the coil, the coil attracts the armature and maintains the door locked;

means disposed in the connecting means for interrupting the connecting means to thereby cut power to the armature and thereby unlock the door;

timing means connected to the interrupting means for activating the interrupting means after a time interval has expired;

switching means associated with the door for starting the timing means upon attempting to open the door, and

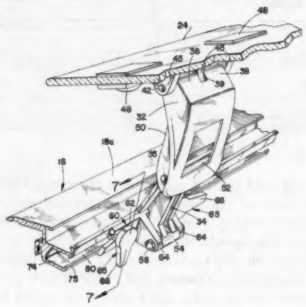
means for permitting the door to open upon pressing thereagainst when power to the armature has been cut to unlock the door.

4,257,632

DETACHABLE LATCHING DEVICE FOR CLOSURE PANELS

George E. DeStepheno, San Dimas, Calif., assignor to Le Van Specialty Co., Inc., Industry, Calif.

Filed Jan. 22, 1979, Ser. No. 5,460
Int. Cl.³ E05C *17/32*
U.S. Cl. 292—263 **10 Claims**



1. A detachable latching device for a closure panel having a fixed frame structure, wherein the device comprises:

a toggle-jointed latch member interconnecting said closure panel to said fixed frame structure;

a mounting bracket affixed adjacent one edge of said closure panel, one end of said toggle-jointed latch member being adapted to be movably attached thereto;

a demountable anchor means arranged to be releasably secured to said fixed frame structure and movably mounted to said toggle-jointed latch member at the end opposite the mounting bracket, wherein said demountable anchor means comprises an anchor bracket having extended flange members adapted to be connected to one end of said toggle-jointed latch member; and

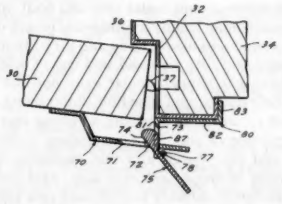
releasable locking means mounted to said anchor means for locking engagement with said fixed frame structure, wherein said releasable locking means comprises lockable cleat members rotatably mounted to said anchor bracket so as to lockably engage said frame structure.

4,257,633

SECURITY DEVICE

Sheldon R. Rosenberg, 2066 E. 23rd St., Brooklyn, N.Y. 11724

Division of Ser. No. 637,098, Dec. 2, 1975, abandoned, which is a division of Ser. No. 491,934, Jul. 25, 1974, Pat. No. 3,963,269. This application Mar. 20, 1979, Ser. No. 22,305
Int. Cl.³ E05C *19/00*
U.S. Cl. 292—304 **10 Claims**



1. Apparatus for preventing unauthorized separation of a

pivotally mounted door from a cooperating buck assembly, the apparatus comprising, in combination:

a first plate member carried by the door in fixed relationship therewith;

a second plate member carried by the buck assembly and having an anti-tampering portion projecting beyond the edge of the buck assembly toward the first plate member;

means for supporting the second plate member on the buck assembly;

a movable element supported by one of the plate members in position to engage the other plate member;

mounting means on said one plate member normally maintaining the movable element in a first coplanar position with said one plate member and said mounting means further defining an axis parallel to the pivotal axis of said door for supporting said element for pivotal movement about said axis to a second noncoplanar position with respect to said one plate member;

means on one of the plate members for receiving the other plate member when the door is closed; and

camming means between said other plate member and said movable element causing said movable element to move to its second position such that the plate members cooperate with each other in the door's closed position to prevent movement of the door in its plane.

4,257,634

VEHICLE DOOR LOCK CONTROL

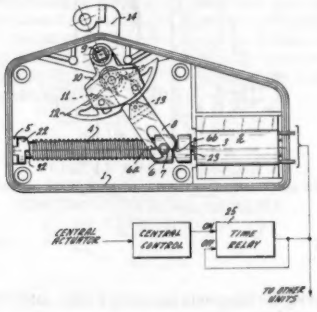
Frank Kleefeldt, and Lothar Krause, both of Heiligenhaus, Fed. Rep. of Germany, assignors to Arn. Kiekert Söhne, Heiligenhaus, Fed. Rep. of Germany

Filed Apr. 30, 1979, Ser. No. 34,412

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1978, 2819143

Int. Cl.[3] **E05C** *0/00*

U.S. Cl. 292—336.3 **4 Claims**



1. In a centrally controlled system for locking the doors of a vehicle, a unit for controlling locking of one of the doors including a motor, a worm gear connected to a drive by the motor, a travelling nut for riding on the gear upon rotation thereof and means for connecting the nut to a door lock operating mechanism, the improvement comprising:

a first pair of stop elements secured respectively to opposite ends of the gear, rotating therewith, and having tangentially-facing stop surfaces;

a second pair of counterstop elements on the travelling nut having tangentially-oriented counterstop surfaces for respectively abutting with the stop surfaces of the elements of the first pair, to stop rotation of the gear upon such abutment and to thereby stop rotation of the motor; and

timing means to limit the time the motor runs to approximately the period it takes to drive the travelling nut from one of the first pairs of stop elements to the respective other one.

4,257,635

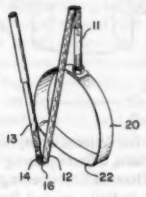
SCOOP DEVICE

Peggy L. Mainprice, 4210 NE. 85th St., Seattle, Wash. 98115

Filed Jan. 8, 1979, Ser. No. 1,530

Int. Cl.[3] **A47F** *13/06*

U.S. Cl. 294—1 BA **13 Claims**



1. A scoop device adapted for collecting animal feces and the like, comprising:

a collapsible, flexible handle;

a continuous rim attached to the lower end of the handle, said rim having a flexible, resilient wide bottom portion which is outwardly bowed in a direction perpendicular to the width of the wide bottom portion, and which, when pressed against a surface, will flex inwardly perpendicular to the width of the bottom portion to generally conform to the surface; and

a disposable bag adapted to be fitted over said rim.

4,257,636

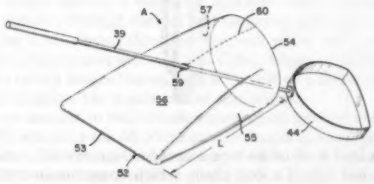
BAG AND BAG AND SCOOP DEVICE COMBINATION

Peggy L. Mainprice, 4210 NE. 85th St., Seattle, Wash. 98115

Continuation-in-part of Ser. No. 1,530, Jan. 8, 1979. This application Sep. 10, 1979, Ser. No. 73,887

Int. Cl.[3] **A47F** *13/06*

U.S. Cl. 294—1 BA **6 Claims**



1. A bag for use on a scoop device adapted to collect animal feces or other debris, comprising:

a flexible bag having a closed end and an open end joined by side walls;

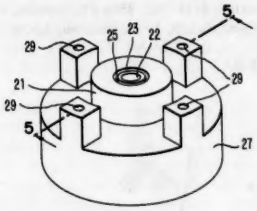
a perforation in one of said side walls adapted to be passed through by a handle of the scoop device for positioning the bag on the scoop device, said perforation being located from the open end between 25 and 50 percent of the total length of the bag; and

easily separable means joining the perforation and the open end of the bag for enlarging the perforation to the open end of the bag for removal of the bag.

4,257,637
CONTACTLESS AIR FILM LIFTING DEVICE

Javathu K. Hassan, Hopewell Junction, and John A. Paivanas, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 28, 1979, Ser. No. 79,767
Int. Cl.³ B66C 1/02
U.S. Cl. 294—64 B **7 Claims**

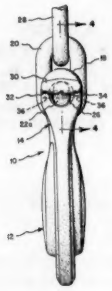


1. A pick-up device for objects comprising a head having a gas flow boundary surface, a first opening in said surface, a gas supply duct connected to said first opening for conveying a gas to said opening, means radially spaced from said first opening for directing a flow of said gas to a second opening adjacent said first opening whereby an object to be picked up is restrained from lateral movement by gas flow forces without the need to provide radially spaced restraining means as the axi-radial forces of the gas flow create sufficient suction to pick up the object.

4,257,638
HOOK LOAD PIN RETENTION SYSTEM

Edmund R. Koval, Tonawanda, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Oct. 6, 1975, Ser. No. 619,596
Int. Cl.³ B66C 1/34
U.S. Cl. 294—82 R **10 Claims**



1. A load hook of the type adapted to be removably attached to the last link of a load chain, which comprises in combination:

a hook body formed integrally with a clevis having a pair of leg portions spaced apart for receiving said last link therebetween, a first of said leg portions being formed with a first bore opening extending therethrough and a second of said leg portions being formed with a second bore opening having an open end facing said first of said leg portions and arranged in axial alignment with said first bore opening, said second of leg portions carrying a shield portion partially blocking an end of said second bore opening spaced remotely relative to said first of said leg portions;

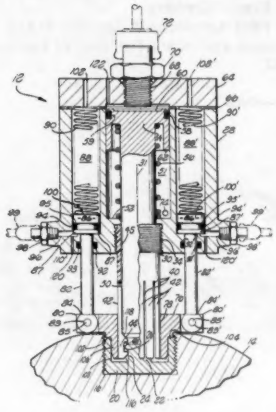
a load pin dimensioned to be removably inserted in succession through said first bore opening, said last link and said second bore opening for inserted end surface abutting engagement with said shield portion, said load pin being of a length such that its opposite end surface is disposed within and spaced inwardly of an outer end of said first bore opening when said inserted end surface is arranged in abutting engagement with said shield portion, said outer end of said first bore opening being spaced remotely relative to said second of said leg portions and

retaining means removably bridging said first bore opening and spaced inwardly of said outer end of said first bore opening for engagement with said opposite end surface of said load pin whereby to cooperate with said shield portion to constrain said load pin against axially directed movements from bearing engagement with said first and second bore openings.

4,257,639
EJECTOR DEVICE FOR STORES

William H. Stock, Columbus, Ohio, assignor to Rockwell International Corporation, Segundo, Calif.

Filed Dec. 17, 1979, Ser. No. 104,219
Int. Cl.³ B64D 1/12
U.S. Cl. 294—83 R **9 Claims**



1. A device for releasably engaging a store, said store having a lug mounted thereto, comprising:

a tubular member having a longitudinal axis and an internal bore substantially aligned with said longitudinal axis, said tubular member having a plurality of lug retaining means attached at one end, said retaining means being movable from a first position, in engagement with said lug, to a second position, disengaged from said lug;

an ejector ram movably mounted in said bore;

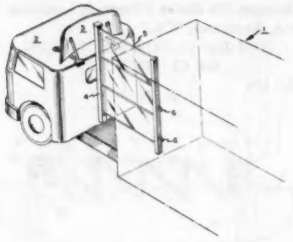
a collar mounted to said tubular member being movable along said longitudinal axis from a first position, wherein said collar locks said retaining means in said first position, to a second position, wherein said collar is disengaged from said retaining means; and

actuation means coupled to said collar and adapted to first move said collar from said first position to said second position and, secondly, to drive said ram toward said lug into engagement with said retaining means, such that said retaining means is moved to said second position.

4,257,640
DRAG REDUCER FOR LAND VEHICLES

Nathaniel C. Wiley, Weston, Conn., assignor to Rudkin-Wiley Corporation, Stratford, Conn.

Continuation-in-part of Ser. No. 641,222, Dec. 16, 1975, abandoned, and Ser. No. 779,086, Mar. 18, 1977, abandoned.
This application Jan. 3, 1978, Ser. No. 866,260
Int. Cl.[3] B62D *35/00*
U.S. Cl. 296—1 S 41 Claims



1. A drag reducer for mounting in the gap of a land vehicle wherein said gap is established by two surfaces defined by a rear panel of a leading element and a leading panel of a trailing element and for substantially reducing cross flow through the gap as the vehicle is moving through a fluid, said drag reducer comprising a substantially vertically disposed, fin-like effective gap sealing member mountable directly in the gap, and

(A) having a forward edge in juxtaposed spaced relationship to said rear panel of the leading element,

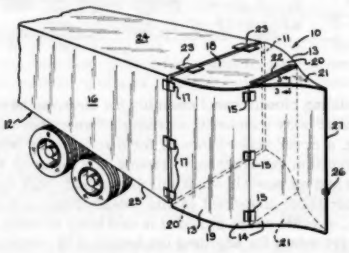
(B) extending therefrom substantially to the leading panel of the trailing element, in transverse air flow blocking relation to the leading and trailing elements, substantially completely filling the horizontal distance between said elements in a single, substantially vertical plane, and

(C) incorporating a movable portion, said portion being flexibly laterally movable and angularly deflectable, with at leat one substantially vertical axis fixed relative to the leading element, thereby providing non-injurious deflection during relative angular movements of the leading and trailing elements.

4,257,641
VEHICLE DRAG REDUCER

Edgar L. Keedy, P.O. Box 83, Liberty Center, Ohio 43532

Filed May 25, 1979, Ser. No. 42,531
Int. Cl.[3] B62D *35/00*
U.S. Cl. 296—1 S 2 Claims

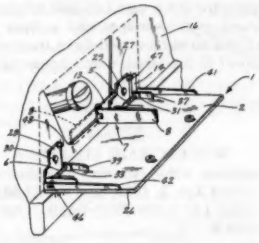


1. A drag reducer for use on a vehicle having two side walls each having a vertical rear edge adjacent a vehicle end, said vehicle further having a roof and a floor each having a rear edge adjacent said vehicle end, said drag reducer comprising two flat side panel assemblies, hinge means pivotally connecting said side panel assemblies to said rear edges of said vehicle side walls, said side panel assemblies converging and having edges meeting at a location spaced from the vehicle end when said drag reducer is in a first position, means for connecting together said meeting edges when said drag reducer is in such first position, top and bottom closing panel assemblies, means connecting said top assembly to said vehicle adjacent said roof rear edge, means connecting said bottom panel assembly to said vehicle adjacent said floor rear edge, said closing panel assemblies extending in the same direction and abutting said side panel assemblies when said drag reducer is positioned in said first position, said closing panel assemblies having edges in contact with abutting edges of said side panel assemblies whereby said side panel assemblies and said closing panel assemblies form an enclosed drag reducer at said vehicle end, catch means releasably connecting said closing panel assembly edges to said abutting edges of said side panel assemblies, and means including said hinge means for positioning said drag reducer in a second position wherein said panel assemblies are collapsed, said hinge means comprising hinge-slide means, said flat panels swinging on said hinge-slide means between said first position and a position with said flat panels parallel with said vehicle side walls and thence sliding forward along rail means attached to said vehicle side walls to said second position wherein said flat panels are substantially flush against said vehicle side walls.

4,257,642
GASOLINE FILL COVER HOLDING ARM

John S. Sampson, 520 2nd St., S.E., Hampton, Iowa 50441

Filed Jan. 2, 1979, Ser. No. 494
Int. Cl.[3] B62D *63/04*
U.S. Cl. 296—1 C 1 Claim



1. In combination with a fill cover pivotally attached to a motor vehicle chassis by a pair of spring hinges, each of said spring hinges having a mounting aperature and a mounting screw installed through each of said mounting aperatures, said mounting screws being threadbly received within said chassis, said mounting screws securing said spring hinges to said chassis, said spring hinges biasing said fill cover to a substantially vertical position, the improvement comprising:

a hinge secured to said chassis intermediate the means pivotally attaching the fill cover to said chassis and operatively connected to one of said spring hinges, which comprise said means, said hinge having a base member in pivotal connection with an arm member, said base member having a mounting aperature, said mounting aperature of said base member being installed in alignment with said mounting aperature of one of said spring members one of said mounting screws being installed through said mounting aperature of said base member and through said mounting aperature of one of said spring hinges, said mounting screw being threadably received within said chassis, said mounting screw rigidly securing said spring hinge and said base member to said chassis, said arm member being thereby pivotally secured to said chassis, said arm member being pivotally moveable to a holding position wherein said arm member holds said fill cover in a substantially horizontal position.

4,257,643

UPPER STREAMLINING APPARATUS FOR THE CAB OF A HEAVY TRANSPORT VEHICLE

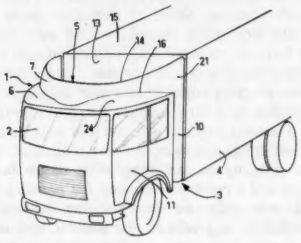
Robert Choulet, La Celle-Saint-Cloud, France, assignor to Societe d'Etudes et de Realisations Automobiles, Paris, France

Filed Mar. 29, 1979, Ser. No. 25,035

Claims priority, application France, Apr. 4, 1978, 78 10467

Int. Cl.[3] B62D *35/00*

U.S. Cl. 296—1 S **14 Claims**



1. A streamlining apparatus for the cab of a heavy transport vehicle, said cab having a roof, an upper roof surface, a front transverse edge, side edges and a transverse section having a width smaller than that of the body of a load being transported by said cab, said apparatus comprising an air-flow deflector having a front part and two lateral rear parts, and an element adapted to engage the roof of the cab and connected to the front part of said deflector, said element comprising lateral parts which are adapted to extend laterally over the cab between said deflector front part and said edges and have substantially curved upper surfaces and a front part which is adapted to extend to at least said front transverse roof edge, both with respect to the forward and downward extent of the cab.

4,257,644

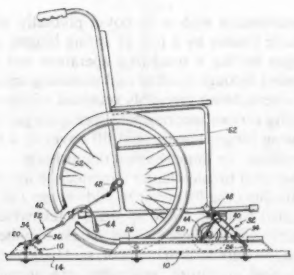
WHEELCHAIR TIE-DOWN

Richard E. Stephens, 10946 Nicosia La., Lakeside, Calif. 92040

Filed Apr. 2, 1979, Ser. No. 25,883

Int. Cl.[3] B60N *1/02*; B62B *11/00*

U.S. Cl. 296—65 R **3 Claims**



1. In a vehicle having a floor and a designated floor area to provide a wheelchair station, a wheelchair tie-down apparatus comprising:

(a) a plurality of coffers mounted to said floor substantially in said designated area, each of said coffers having ramp-like walls and a hinged, substantially flat lid spanning the tops of said walls to permit a wheelchair to roll over said coffers with relative ease;

(b) an anchor member mounted in each coffer;

(c) a flexible strap for each of said anchor members, said straps each having a tethered end connected to an anchor member and a distal end having a wheelchair-engaging means thereon;

(d) each of said straps being dimensioned to lie within a respective one of said coffers when not in use and having a manually operable length adjustable means for cinching down said wheelchair when not in use.

4,257,645

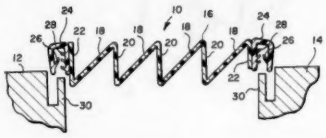
FLEXIBLE SHEET SEAL

Thomas K. Balogh, Elk Grove Village, Ill., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Jan. 12, 1979, Ser. No. 2,893

Int. Cl.[3] B60P *3/32*

U.S. Cl. 296—166 **8 Claims**



1. A flexible sheet seal for joining first and second spaced apart flange members in waterproof and airtight sealing engagement for sealing the space spanning the flange members comprising:

a first elongated channel-shaped element of said sheet seal adapted to be pressed in sealing engagement onto the first flange member;

a flexible sheet material having one end secured in sealing engagement only to an outer surface portion of one leg of the first channel-shaped element; and

means coupled to the opposite end of the sheet material for securing the opposite end to the second flange member in sealing engagement.

4,257,646

SLIDING COVER FOR MOTOR VEHICLES

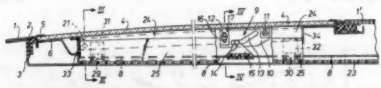
Walter Schützler, Aufhausen, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH and Co., Munich, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 51,757

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827889

Int. Cl.[3] B60J *7/04*

U.S. Cl. 296—222 **18 Claims**

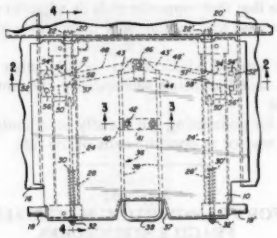


1. A sliding closure panel assembly for covering an opening in a vehicle body member comprising a frame delimiting said opening, a cover panel mounted for displacement between a closed position covering said opening and an open position lowered and retracted beneath a fixed rear body part, front and rear guide shoes connected to said closure panel and slidably received in guide tracks provided in said body member, height adjustment means for adjusting the height of the closure panel in said closed position, and a pair of guide shield means positioned near lateral edges of said cover panel for covering gaps existing between the underside of the cover panel and lower edges of said frame, each of said pair of said guide shield means including an essentially strip-shaped upper shield part releasably mounted to said closure panel extending downwardly, and an essentially strip-shaped lower shield part releasably mounted on said frame and extending upwardly.

4,257,647
DUAL LATCH OF DRIVER'S CHAIR

Albert Gianessi, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 21, 1978, Ser. No. 5,731
Int. Cl.³ A47C *1/00*
U.S. Cl. 297—336 **8 Claims**



1. A latch assembly for a seat pivotably mounted about a base **(16)**, comprising:

a seat frame **(10)**;

a first latch means **(20,24)** mounted on said seat frame **(10)** and having a latch block **(20)** movable between a base engaging and a base disengaging position;

a second latch means **(20',24')** mounted on said frame **(10)** and having a latch block **(20)** movable between a base engaging and a base disengaging position;

a first actuating arm **(48)** extending substantially transversely through a slot **(34)** in said first latch block **(20)**;

a secnd actuating arm **(48')** extending substantially transversely through a slot **(34')** in said second latch block **(20')**;

a single releasing means **(36)** carried by said seat frame and coupled to overlapping proximal end portions **(43,43')** of said first **(48)** and second **(48')** actuating arms; and

pivot means **(52,52')** carried by the seat frame **(10)** and engaging, respectively, with a distal end portion **(50,50')** of said first and said second actuating arms **(48,48')**, said releasing means being moved to pivot said actuating arms to move said latch blocks **(20,20')** simultaneously from a catch **(22)** engaging position to a catch disengaging position.

4,257,648
NON-RESONANT CYCLIC DRIVE SYSTEM EMPLOYING RECTIFICATION OF THE CYCLIC OUTPUT

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Apr. 9, 1979, Ser. No. 28,041
Int. Cl.³ B25D *11/06*; A01B *35/00*
U.S. Cl. 299—37 **14 Claims**

1. A non-resonant cyclic drive system for cutting into a hard material load by means of unidirectional cyclic force pulses comprising

an orbiting mass oscillator including an eccentric rotor and a housing for rotatably supporting said rotor,

means for driving said oscillator so as to induce non-resonant longitudinal vibration of said housing,

means for supporting said housing for reciprocal motion substantially in the directions of said longitudinal vibration,

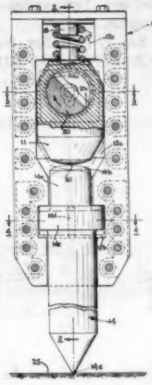
a cutting tool having a cutter head, said cutter head being biased against said load by the weight of said tool,

means for supporting said tool for reciprocal motion substantially in the directions of said longitudinal vibration,

means for biasing said housing towards said tool, and

stop means for limiting the furthest travel of said tool toward said housing to a predetermined position,

a predetermined gap being formed between said housing and said tool at the furthest vibratory excursion of said housing away from said tool and said housing initially contacting said tool during its vibratory excursion towards said

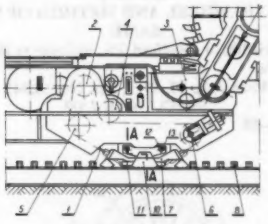


tool approximately at the midpoint of said last-mentioned excursion.

4,257,649
COAL COMBINE

Janusz Sedlaczek, Gliwice; Marian Krutki, Katowice, and Kornel Olender, Gliwice, all of Poland, assignors to Centralny Osrodek Projektowokonstrukcyjny Maszyn Gorniczych "Komag", Gilwicke, Poland

Filed Mar. 12, 1979, Ser. No. 19,641
Claims priority, application Poland, May 3, 1978, 205805
Int. Cl.³ E21C *29/24*
U.S. Cl. 299—43 **1 Claim**

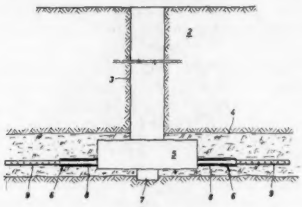


1. An improved coal combine advancing on a conveyor, provided with a device driving the combine along the said conveyor, employing an endless link chain rewound by means of a drive wheel and a reversible wheel, said chain meshing in its straight section, with a chain rack fixed alongside of the conveyor, said combine being disposed at the side of the driving device on the conveyor, by means of a railing forming a part of the conveyor being further situated along the whole length of the conveyor, and the combine resting on said railing by means of a tubular slipper fixed to the combine, the improvement comprising; cranked axles **(12)** fixing the tubular slipper **(10)** to the body **(3)**, said axles **(12)** being mounted in the body **(3)** of the combine, the body **(3)** of the combine having a grooved hole **(17)** whose axis **(15)** is in line with the geometrical axis of the cranked axle **(12)** and an extension of the said cranked axle **(12)** being provided with a splined tip embedded in the hole **(17)**.

4,257,650
METHOD FOR RECOVERING SUBSURFACE EARTH SUBSTANCES

Joseph C. Allen, Bellaire, Tex., assignor to Barber Heavy Oil Process, Inc., Houston, Tex.

Filed Sep. 7, 1978, Ser. No. 940,390
Int. Cl.[3] E21B *43/24*; E21C *41/10*
U.S. Cl. 299—2 9 Claims

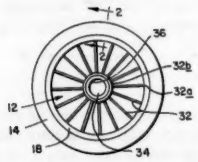


1. A method of recovering oil and the like from a subsurface earth formation, comprising the steps of:
establishing a shaft hole extending from the surface of the earth to said subsurface earth formation;
drilling a plurality of boreholes substantially laterally from said shaft hole into said subsurface earth formation;
injecting a heating fluid comprising substantially steam into said boreholes during a first discrete time interval for transferring heat to said oil in said formation,
thereafter injecting a pressurizing fluid comprising substantially an inert gas into said boreholes during a second discrete interval for exerting a downward pressure on said oil in said formation, and
withdrawing oil from said boreholes in response to said downward pressure exerted in said formation during a third time interval following said first and second time intervals.

4,257,651
PNEUMATIC WHEEL AND METHOD OF MAKING SAME

William E. Griffith, Jr., Bedford, Pa., assignor to Hedstrom Co., Bedford, Pa.

Filed Aug. 23, 1979, Ser. No. 68,942
Int. Cl.[3] B60B *1/02*
U.S. Cl. 301—58 9 Claims

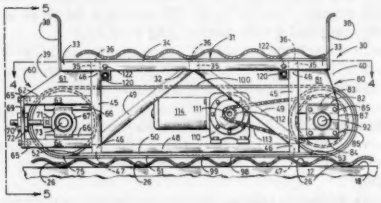


1. An improved wheel for a pneumatic tire comprising
A. an outer circular rim having
1. a radially inner face and a radially outer face,
2. a pair of radially outwardly extending tire-engagble flanges at the opposite ends of the rim, and
3. a relatively wide groove formed in the inner face of the rim, said groove extending around the entire circumference of the rim,
B. a substantially circular split hoop having a radially inner face and a radially outer face, the width and thickness of said hoop approximating those of the groove in the rim and the circumference of the hoop assuming that of the groove so that the hoop seats in the groove with the free ends of the hoop reposing adjacent one another,
C. means for securing the hoop to the rim so as to form a laminated annular structure,
D. an array of spokes having corresponding first ends welded to the radially inner face of the hoop at substantially equally spaced-apart locations around the circumference of the hoop, said spokes being oriented radially inward so that their opposite ends lie adjacent an imaginary circle whose axis substantially coincides with that of the rim,
E. a hub located adjacent the radially inner ends of the spokes, said hub being substantially concentric with the rim, and
F. means for connecting the radially inner ends of alternate spokes near or at opposite ends of the hub.

4,257,652
DEVICE FOR TRANSPORTING MATERIALS ACROSS FRAGILE STRUCTURES

Charles R. Edwards, 2412 N. Thorne, Fresno, Calif. 93704

Filed Nov. 20, 1978, Ser. No. 961,988
Int. Cl.[3] B62D *55/24*
U.S. Cl. 305—24 2 Claims



1. A device for transporting materials across structures having an elongated rigid beam overlayed by relatively fragile sheet material, the device comprising a rigid frame; a pair of substantially cylindrical assemblies individually mounted on the frame for rotation about individual substantially parallel axes of rotation substantially normal to a predetermined path of travel for the device and one of said cylindrical assemblies composed of a pair of substantially axially aligned substantially cylindrical components spaced from each other to form a passage therebetween; a plate secured on the frame having a substantially flat lower surface extending between the cylindrical assemblies to edges individually adjacent to the cylindrical assemblies and the lower surface lying in a plane substantially tangent to the cylindrical assemblies; a continuous belt extending about said cylindrical assemblies having a substantially flat lower run extending between the cylindrical assemblies in facing engagement with the lower surface of said plate; and means borne by the frame and extending through said passage and into driving engagement with the cylindrical assembly thereof for rotating said cylindrical assembly to transport the belt about the cylindrical assemblies and the lower run of the belt along the lower surface of the plate with said lower run rested on said sheet material and aligned with and above the rigid beam to transport the device along said path of travel on the sheet material along the beam.

4,257,653
TRACK ASSEMBLY FOR TRACK-TYPE VEHICLES WITH DUAL LINK ASSEMBLIES

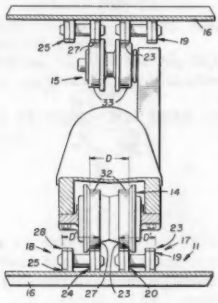
Thomas C. Meisel, Jr., Peoria, and Robert N. Stedman, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 23, 1979, Ser. No. 69,021
Int. Cl.[3] B62D *55/12*, *55/20*
U.S. Cl. 305—28 13 Claims

1. In a track-type vehicle (10) of the type comprising a drive

sprocket (12), an idler (13), a plurality of longitudinally spaced track rollers (14), and an endless track assembly (11), including a plurality of track shoes (16) and a pair of first (17) and second (18) laterally spaced link assemblies, each having laterally spaced sets of inboard (20,24) and outboard (19,25) links secured to said track shoes (16) with at least each set of said inboard links (20,24) defining a generally continuous rail surface (22,27) thereon, and pivot means (21,26) for pivotally connecting each pair of laterally spaced inboard (20,24) and outboard (19,25) links together, the improvement comprising

Each of said idler (13) and said track rollers (14) being solely engageable in load bearing contact with the rail surfaces (22,27) defined on each set of the inboard links (20,24) of said first (17) and second (18) link assemblies.



4,257,654

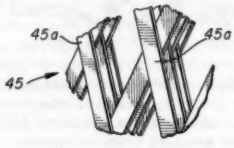
FILAMENT WOUND BEARING

Hugh E. Keepers, Farmers Branch, Tex., assignor to Varel Manufacturing Company, Dallas, Tex.

Filed Jan. 22, 1979, Ser. No. 5,396

Int. Cl.³ F16C *17/12*

U.S. Cl. 308—8.2 **7 Claims**



1. A rotary rock bit with at least one rotary cone cutter having an internal recess receiving a journal pin for mounting said cutter, and a sleeve bearing in the internal recess and engaging an outer surface of the journal pin, said bearing comprising:

a crosscrossed, multilayered porous, flat wire wound cylindrical body, and

a nonliquid antigalling material infiltrated into said cylindrical body to substantially fill the porous areas thereof.

4,257,655

ROLLING BEARING HAVING SEPARATE RESTRAINING RING FOR HOLDING ROLLING ELEMENTS

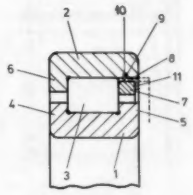
Knut Mirring, Gochsheim, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 26, 1978, Ser. No. 954,769

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 7733084[U]

Int. Cl.³ F16C *33/58*

U.S. Cl. 308—216 **7 Claims**



1. In a rolling bearing having an at least partially axially extending bearing race ring for engaging rolling elements, and a separate annular flange ring mounted to restrain axial movement of said rolling elements; the improvement wherein the flange ring is completely separated and radially spaced from said race ring, said race having an annular groove radially aligned with a portion of said flange ring, a retaining ring, said retaining ring extending radially into said annular groove and having a portion extending thence axially outwardly of said bearing to entirely fill the space in a radial direction between said bearing race ring and flange ring, in the region axially outwardly of said groove, said portion of said retaining ring having an end axially engaging an axial outer end surface of said flange ring, said end axially holding said flange ring in said bearing.

4,257,656

FIRE PROTECTION CABINET

Friedrich Rothhaas, Bellheim, and Günther Pichler, Germersheim, both of Fed. Rep. of Germany, assignors to Sistemco N.V., Curaco, Netherlands Antilles

Filed Apr. 3, 1979, Ser. No. 26,745

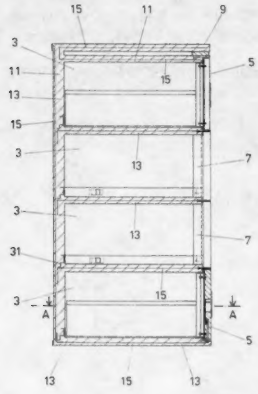
Claims priority, application Switzerland, Apr. 17, 1978, 4071783

Int. Cl.³ A47B *81/00*

U.S. Cl. 312—214 **9 Claims**

1. A fire protection cabinet having an outer casing and an inner structure, said inner structure providing at least one drawer compartment in which a drawer is supported on said inner structure, and having a gypsum filling in the space between said outer casing and said inner structure, and having also the improvement which consists in that:

the inner structure is floatingly suspended and supported in and by the gypsum filling (13); and



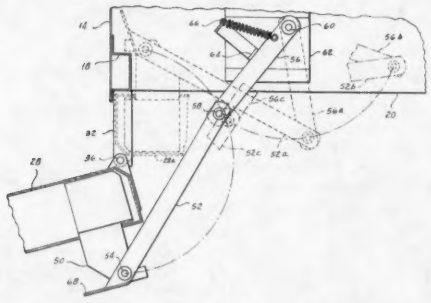
anchoring means (27,31) extending out from the inner structure into the gypsum filling are provided for anchoring said inner structure in the gypsum filling (13).

4,257,657

READILY RELEASABLE MECHANISM FOR LOCKING A MERCHANDISING MACHINE DOOR IN OPEN POSITION

Albert Kurimsky, Denville, N.J., assignor to Rowe International, Inc., Whippany, N.J.

Filed Aug. 28, 1978, Ser. No. 937,335
Int. Cl.³ A47B *81/00*; E05C *17/32*; B65D *43/24*
U.S. Cl. 312—291 **7 Claims**



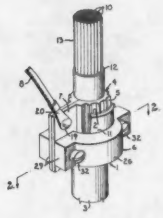
1. In a merchandising machine including a cabinet and a door providing access to the interior of the cabinet, said door being pivotally attached to the cabinet for movement away from said cabinet in a certain angular direction around a vertical pivot axis, the improvement comprising first and second link arms respectively pivotally coupled to lower portions of the door and the cabinet at first and second pivot points and pivotally interconnected at a third pivot point for movement from a position at which said door is closed to a position in which said pivot points are aligned, means for preventing the movement of said second arm in said angular direction past a locking position beyond said aligned position, and means for biasing said arms from said aligned position into said locking position, said first arm including an extension on the other side of said first pivot point from said second arm to permit ready kick release of said arms from said locking position.

4,257,658

CABLE SHIELD CONNECTOR ASSEMBLY

Daniel L. Hammond, 123 S. Main, Windsor, Mo. 65360, and Philip G. Jeffries, #2 O'Donnel Ct., Little Rock, Ak. 72204

Filed May 7, 1979, Ser. No. 36,549
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—14 R **10 Claims**



1. A cable shield connector assembly for a cable having a ground shield surrounding a bundle of insulated conductors and an external insulation sheath surrounding said shield, said assembly comprising:

(a) conductive sleeve means for insertion into surrounding relation to said bundle and within said shield;

(b) outwardly directed ridges integral with said sleeve means and distributed over a substantial circumferential portion of the outer surface of said sleeve means;

(c) clamp means for positioning on said cable surrounding said sleeve means with a portion of said shield and said sheath between said sleeve means and said clamp means to thereby urge said shield into electrical contact with said ridges; and

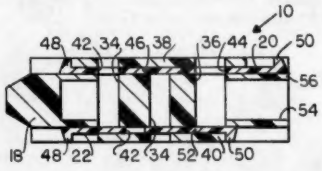
(d) terminal means on said sleeve means to receive a ground conductor for electrical communication with said shield by way of said sleeve means.

4,257,659

ELECTRICAL CONNECTOR WITH SAFETY COVER MEANS

Ronald D. Gibbs, Naperville, Ill., assignor to Belden Corporation, Geneva, Ill.

Filed Sep. 28, 1979, Ser. No. 80,109
Int. Cl.³ H01R *13/44*
U.S. Cl. 339—36 **6 Claims**



1. In an electrical connector of the extension type including a body having a pair of spaced-apart, plug-in receptacles arranged upon one surface of the connector body and a third plug-in receptacle arranged upon an opposite surface of the connector body, each receptacle including a pair of contact sockets for selectively receiving the prongs of a plug-type connector, the improvement comprising the body being of unitary construction and forming first and second elongated slots respectively underlying said one surface and said opposite surface, a first cover plate slideably arranged within said first slot, said first cover plate forming two pairs of apertures arranged for alignment with the contact sockets of the two receptacles whereby said first cover plate may be positioned to simultaneously expose or shield both receptacles, and a second cover plate slideably disposed within said second slot and

forming a single pair of apertures arranged for alignment with the contact sockets of the single receptacle whereby said first and second cover plates may be slideably positioned to alternatively expose one, two or three receptacles or to simultaneously shield all three receptacles.

4,257,660

ELECTRIC CONNECTOR HAVING A PLURALITY OF IN-LINE CONTACTS

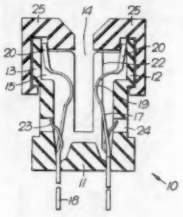
Walter M. Chalmers, Dundee, Scotland, assignor to Ferranti Limited, Hollinwood, England

Filed Jul. 17, 1979, Ser. No. 58,133

Claims priority, application United Kingdom, Jul. 18, 1978, 30205/78

Int. Cl.³ H01R *13/62*; H05K *1/07*

U.S. Cl. 339—74 R **1 Claim**



1. An electric connector which includes a housing of electrically-insulating material having a base and two side walls together defining a longitudinal slot from which extend a plurality of transverse openings, and a plurality of electrically-conducting contact members located one in each of at least some of the transverse openings, each contact member comprising a terminal portion arranged to extend from the base of the housing, a contact portion arranged to project into the longitudinal slot, and an actuating portion extending from the end of the contact portion remote from the terminal portion, the actuating portions of all the contact members located in transverse openings on the same side of the longitudinal slot being in line and parallel with one another such that they may be displaced to withdraw the contact portions of the contact members from the longitudinal slot, the transverse openings of the housing located on one side of the longitudinal slot being separated from one another by projecting walls extending from the corresponding side walls, and in which each contact member includes a projecting tab on each contact member arranged to engage a face of the associated projecting wall and a removable actuating tool for engaging the actuating portions and engaging the housing in which each projecting wall is shorter than the corresponding side wall of the housing, the actuating portion of each contact member extending into the region between the top of a projecting wall and the top of a side wall, said actuating tool engaging said contact portion within said region and being movable in a direction parallel to said longitudinal slot to cause all contact portions on one side of said slot to be retracted from said slot.

4,257,661

RETAINER FOR ELASTOMERIC ELECTRICAL CONNECTOR

Chris A. Dalamangas, Union, and Thomas P. Piccirillo, North Plainfield, both of N.J., assignors to Technical Wire Products, Inc., Cranford, N.J.

Continuation of Ser. No. 846,344, Oct. 28, 1977, abandoned. This application Apr. 30, 1979, Ser. No. 34,954

Int. Cl.³ H01R *13/20*

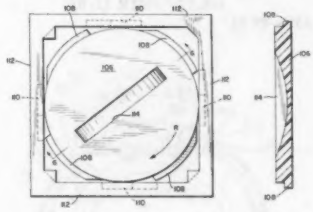
U.S. Cl. 339—75 MP **4 Claims**

1. A large-scale integrated circuit chip retainer for connecting with elastomeric electrical contacts a large-scale integrated circuit chip to a printed circuit board, the retainer comprising:

a generally square planar body having an upper surface and a lower surface,

four mounting studs extending from the lower surface of the square planar body at the corners thereof for engaging a printed circuit board,

four upstanding sidewalls around the perimeter of the upper surface of the square planar body defining a cavity for receiving a large-scale integrated circuit chip, each upstanding sidewall having a horizontal slot on at least the inside surface thereof forming a keyway,



four linearly elongated apertures for receiving the elastomeric electrical contacts through the planar body, each aperture being situated immediately adjacent and parallel to the inside surface of each corresponding upstanding sidewall, the apertures being in communication with said cavity,

a removable, generally circular, planar closure for closing said cavity, the closure having on the perimeter thereof four flanges for engaging said horizontal slots in said sidewalls upon rotation of the closure with respect to the sidewalls thereby insuring any included large-scale integrated circuit chip contacts the elastomeric electrical contacts in the apertures connecting the same through the apertures to any underlying printed circuit board.

4,257,662

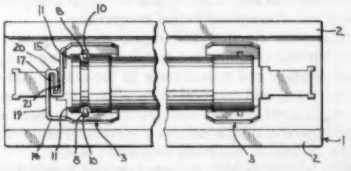
FUSEHOLDER WITH SEPARATE REJECT SPRING HAVING INTEGRAL SPREADING AND COLLAPSING CONTROL MEANS

Roger H. Motten, Jr., Deltona, Fla., assignor to Marathon Electric Manufacturing Corp., Wausau, Wis.

Filed Oct. 30, 1979, Ser. No. 89,760

Int. Cl.³ H01R *11/22*, *13/64*

U.S. Cl. 339—186 R **7 Claims**



1. A fuse rejection and reinforcing member for use with a ferrule type fuse having a groove therein disposed to be assembled with a fuse clip on a fuseholder, said fuse rejection member comprising a body portion having complementary aligned abutments extending through apertures into the inside of the fuse clip from opposite sides of the clip and adapted to receive the groove of said fuse, integral members connected to the abutments and terminating in inwardly projecting control arms at one end of the fuse clip, latching means connecting the control arms together, with said latching connection means having a construction whereby the control arms have relative

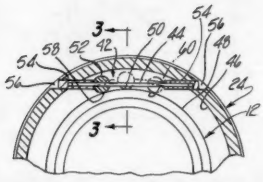
lateral movement within predetermined limits to control lateral movement of the abutments within predetermined limits both outwardly and inwardly to respectively accept the groove of a ferrule type fuse when moved outwardly or prevent collapse of the fuse clip when moved inwardly.

4,257,663

BALL LOADED ANTI-DECOUPLING DEVICE FOR ELECTRICAL CONNECTORS

Robert W. Brush, Unadilla; Dee A. Werth, Nineveh, and Alan L. Schildkraut, Sidney, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 7, 1979, Ser. No. 101,372
Int. Cl.[3] H01R *13/62*
U.S. Cl. 339—89 M 10 Claims



1. An electrical connector comprising:

first and second generally cylindrical electrical connector bodies, each carrying electrical contacts moved into mating relationship by axial mating movement between said first and second connector bodies;

a coupling nut member adapted to be received over said first and second connector bodies with said electrical connector bodies in mating engagement;

said coupling nut member formed with an internal thread mating with an external thread formed on one of said first or second electrical connector bodies;

said coupling nut member further formed with a radially inwardly extending flange portion in surrounding relationship with the other of said first or second electrical connector bodies;

an abutment formed on said other of said first or second connector bodies axially engaging said coupling nut member flange portion during rotation of said coupling nut member on said one of said first or second electrical connector bodies;

whereby said first and second electrical connector bodies are drawn into mating engagement by said rotation of said coupling nut member;

anti-decoupling means acting between said coupling nut member and said other of said electrical connector bodies, said anti-decoupling means comprising:

a deflectable mandrel and means mounting said mandrel within said coupling nut member extending in a generally radial plane and transversely to the axis of said electrical connector, said mandrel being affixed at either end to said coupling nut member and disposed to be passed adjacent a portion of a cylindrical outer surface of said other of said first or second electrical connector bodies;

a cam element slidably mounted on said mandrel, of greater radial dimension than a clearance space between said mandrel and said adjacent portion of said other of said electrical connector bodies;

means limiting said cam element on said mandrel to axial positions in frictional engagement with said outer surface portion of said other of said first or second electrical connector bodies in every position on said mandrel on either side of said immediately adjacent portion;

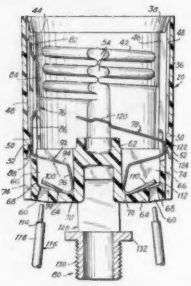
whereby relative rotation between said coupling nut member and said other of said first or second electrical connector bodies in a direction tending to cause sliding movement of said cam element towards said immediately adjacent portion of said first or second electrical connector bodies is resisted by friction and the stiffness of said mandrel and relative rotation in the opposite direction is resisted only by the contact friction of said cam element on said surface portion of said other of said first or second electrical connector bodies.

4,257,664

SCREW SOCKET FOR AN ELECTRIC LAMP

Ronald G. Munroe, Georgetown, S.C., assignor to Eagle Electric Mfg. Co., Inc., Long Island City, N.Y.

Filed Mar. 8, 1979, Ser. No. 18,719
Int. Cl.[3] H01R *13/42*
U.S. Cl. 339—95 D 17 Claims



1. A screw socket into which an electric light bulb having an externally threaded base and an electrically insulated central button contact is insertable and engageable, said socket comprising:

(A) a cylindrical husk of electrically non-conductive material, the interior of the husk being threaded to receive the base of the bulb, said husk having an open mouth at one end and an electrically non-conductive bottom closure wall at the other end,

(B) a pair of electrically conductive contact/wire termination strips,

(i) each strip constituting a single piece,

(ii) each strip being formed to provide a contact at one end thereof and a wire termination at the opposite end,

(C) means to anchor and locate said strips in said husk with the contact end of one strip lying alongside and spaced from the side of the husk in a position to be resiliently engaged by the threaded base of the bulb and with the contact end of the other strip crossing the center of the husk near and spaced from the bottom wall so as to be resiliently engaged by the central button of the bulb, said means to anchor said strips in said husk including a tine outwardly struck from each strip, with the free ends of the tines facing the open mouth of the husk, the bases of the tines being in one piece with the strips, and wherein the husk is provided with shoulders that face the bottom closure wall, the tips of the tines abutting the shoulders to prevent movement of the strips in a direction toward the mouth of the husk, said strips having portions butting against the surface of the bottom closure wall which faces the mouth of the husk,

(D) said bottom wall having through spaced openings,

(i) each opening being in alignment with a different one of the strips,

(ii) the wire termination end of each strip lying across the opening associated with that strip,

(E) each said wire termination end having an intermediate portion anchored in the husk and a cantilever reach terminating in a tip, the portion of said wire termination end anchored in the husk including said portions of said strips which butt against the inner surface of the bottom closure

wall which faces the mouth of the husk, said butting portions of said strips constituting means to hold a portion of each strip between the wire termination end and an intermediate part of the strip under compression and to leave the cantilever reach free to flex, the cantilever reach being aligned with and extending across an associated opening and the tip being near the side wall of the husk so that when a bare wire core is inserted in the opening and thrust against the cantilever reach, the reach will deflect inwardly to permit entry of the wire past the tip and push the entry end of the wire toward the side wall of the husk.

4,257,665

POLARIZED ELECTRICAL CONNECTOR

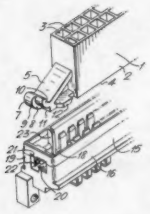
Heinrich John, Rodgau, and Eike Koster, Eppertshausen, both of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 25, 1979, Ser. No. 6,414

Claims priority, application United Kingdom, Feb. 1, 1978, 4379/78

Int. Cl.³ H01R *13/645*

U.S. Cl. 339—186 M **3 Claims**



1. A two part electrical connector comprising a first housing part of generally rectangular slab like form and slidably receivable within a hood portion of a complementary second housing part to engage respective contacts of the housing parts, said first housing part including an extension at one end thereof, said extension being elongated and having a tip at the end thereof engageable with an aperture associated with said second housing part, said tip having a stepped configuration including portions of different thickness measured across the width of said extension, said portions of different thickness each including an arcuate surface facing in the mating direction of the housing parts whereby said arcuate surfaces allow for pivotal movement between said housing parts to mate said housing parts when said tip engages said aperture, said aperture of said second housing part being formed in an endwall of said hood and having a stepped configuration complementary to said tip of said extension.

4,257,666

PLUG

Friedrich Schauer, Heroldsberg, and Manfred Wolff, Schwarzenbruch, both of Fed. Rep. of Germany, assignors to Kabel- und Metallwerke Gutehoffnungshütte AG., Hanover, Fed. Rep. of Germany

Filed Dec. 8, 1978, Ser. No. 967,588

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1977, 7738717

Int. Cl.³ H01R *19/70, 19/72*

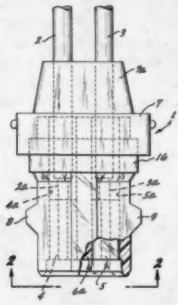
U.S. Cl. 339—218 M **4 Claims**

1. A female plug for electrical connections and cooperation with a male plug, comprising:

a carrier member of internally open construction, being particularly open in a front and rear opposite the front;

a pair of hinge members, hinged along opposite edges of the rear of said carrier member, and provided with snap-on lock means to be locked together for air-tightly holding the hinge members together, the hinge members each having complementary duct means, together defining ducts for respectively receiving, holding, and clamping airtight two conductors, said hinge members when unlocked opening the interior of the carrier member for access from the rear;

a pair of contacts, respectively connected to the ends of the conductors and disposed in said interior as adjacent portions of the conductors are held in the said duct means by the locked-together hinge parts, said contacts configured to resiliently yield laterally upon insertion of male contacts, without impediment by the carrier member; and



a protective plug body, molded around and embedding the interlocked hinge members and embedding portions of the conductors extending outwardly from the interlocked hinge members.

4,257,667

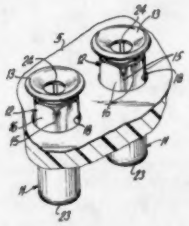
NON-INSULATED PRINTED CIRCUIT JACK WITH RETAINING FEATURE

James Iantorno, Mamaroneck, N.Y., assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Mar. 9, 1979, Ser. No. 19,081

Int. Cl.² H01R *9/16*

U.S. Cl. 339—221 R **7 Claims**



1. An electrical connector for engagement with a printed circuit board, said printed circuit board having a circular aperture for receiving said connector, said connector comprising:

a generally tubular unitary shell member formed from a flexible, electrically conductive material, said shell member being a drawn tube having a closed bottom end and an open top end, with the circumference of said shell member being continuous throughout the length thereof, and

a tubular contact member formed from an electrically conductive material, said tubular contact member being disposed within and fixedly connected at one end thereof to the open end of said shell for receiving and retaining an electrical conductor, said shell member including:

an integral minor diameter portion disposed adjacent the

bottom closed end of the shell member, said minor diameter portion being generally circular in cross-section, with the diameter thereof being less than the diameter of the circular aperture in said printed circuit board and greater than the diameter of said tubular contact member, said minor diameter portion thereby being freely receivable in said printed circuit board aperture; and

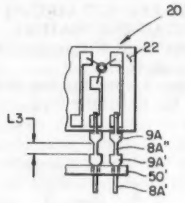
an integral, flexible retaining portion disposed intermediate the length of the shell member, said retaining portion being generally a polygon in cross-section having alternating corner portions and side portions, said corner portions and side portions being disposed in opposed pairs, each corner portion of an opposed pair of corner portions being spaced a distance greater than the diameter of the circular aperture in said printed circuit board, said corner portions thereby being resistively receivable in said printed circuit board aperture, such that when said retaining portion is inserted into said printed circuit board aperture the inner edge of the printed circuit board defining said printed circuit board aperture pushes inwardly on said corner portions and effects the outward expansion of said side portions whereby said retaining portion tends to conform to the configuration of said printed circuit board aperture and provide an interference fit between said retaining portion and said printed circuit board.

4,257,668

EDGE CLIP TERMINAL FOR MOUNTING THICK FILM HYBRID CIRCUITS IN PRINTED CIRCUIT BOARDS

Paul R. Ellis, Jr., Albuquerque, N. Mex., assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Jan. 2, 1979, Ser. No. 417
Int. Cl.³ H01R *13/12*
U.S. Cl. 339—258 R **2 Claims**



1. An improved edge clip terminal for mounting a hybrid substrate on a mother board having holes therein that are associated with conductive material on the board, comprising:

a plurality of tines on one end thereof for clipping over the edge of a substrate;

first and second lead sections;

a first transition region connecting said tines to said first lead section; and

a second transition region interconnecting said first and second lead sections which have dimensions in cross-section that are much smaller than those of said first and second transition regions;

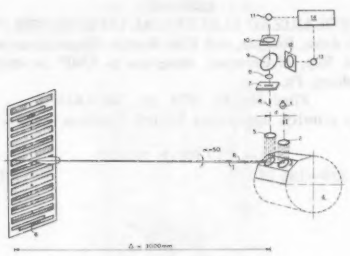
the free end of said second lead section being adapted for insertion into a hole in the board and for being soldered to conductive material thereon, with a dimension in cross-section of the second transition region being greater than the breadth of the hole for contacting conductive material or a surface of the board for supporting the leaded substrate and first lead section above the board; the length of the second transition region being sufficient to prevent molten solder wicking up said first lead section and first transition region and into the area of said tines during a wave solder operation so that the leaded substrate may be tilted without damaging it.

4,257,669

OPTICAL-ELECTRONIC SYSTEM FOR THE IDENTIFICATION OF A RETRO-REFLECTIVE LABEL

Ionel R. Scorteanu, Bucharest; Emil Spirea, Str. Palazu Mare, and Radu Cristea, Bucharest, all of Romania, assignors to Institutul de Cergetari s Proiectari Technologice in Transporturi, Bucharest, Romania

Filed Jun. 5, 1979, Ser. No. 45,688
Claims priority, application Romania, Apr. 16, 1979, 97240
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—6.8 **8 Claims**



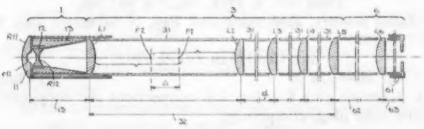
5. In an optoelectronic system for scanning a label affixed to an object such as a vehicle, said label having a plurality of color areas encoding information pertaining to said object, said optoelectronic system comprising a rotatable wheel having a multiplicity of peripherally disposed outwardly facing planar mirrors on said wheel successively reflecting, during rotation of said wheel, a beam of light from a source toward said label and a return beam therefrom toward a transducer assembly for converting color light beams from said strips into electronic signals fed to a processor, the improvement comprising a first lens between said wheel and said source for transmitting a beam of light therefrom to a first surface area of an effective one of said mirrors to be reflected thereby along a first path toward said label, and a second lens between said wheel and said transducer assembly for transmitting thereto a return light beam reflected, upon incidence of the beam from said source on said label, along a second path separated from said first path to a second surface area of said effective mirror and reflected therefrom to said second lens, said first lens and said second lens being spaced apart from one another and having substantially parallel axes, said effective mirror having a width one-and-one-half times the diameter of the larger of said first lens and said second lens.

4,257,670

OPTICAL PEEPHOLE DEVICE INSERTABLE IN THICK WALLS FOR PANORAMIC VIEWING THERETHROUGH

Daniel L. Legrand, 61 Ave. des Sources Chateau-Robert, Saint-Yorre, France

Filed Sep. 13, 1978, Ser. No. 941,942
Int. Cl.³ G02B *21/00, 25/04*
U.S. Cl. 350—8 **9 Claims**



1. An optical device insertable through a peephole in the wall of a chamber such as a bank vault having a thickness greater than about 10 centimeters, making it possible for an observer to obtain a panoramic view of the interior and of the

objects dispersed therein; said device being constituted by an optical system formed by three lens assemblies disposed successively in cooperative relation along a common central optical axis in said peephole; said system comprising:

A. a wide-angle first lens assembly placed in the peephole adjacent the chamber side thereof to create a virtual image of the interior and the objects dispersed therein at a position in front of this assembly;

B. A convergent second lens assembly placed in the peephole behind the first assembly and having a length approaching the thickness of the wall, said second assembly having an entry and exit to optically derive from the virtual image developed by the first assembly a final image which is positioned adjacent said exit; and

C. an accommodation third lens assembly placed in the peephole behind the second assembly and accessible to the observer to permit an observer's eye located behind it to see the final image developed by the second assembly at an apparent diameter which is essentially equal to that at which the virtual image is seen from the entry of the second assembly whereby objects in the interior may be seen in a manner essentially equivalent in image quality to that observable when made directly with the first and third assemblies;

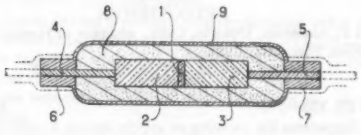
D. said first assembly comprises a doublet constituted by a thick edged meniscus whose front face has a radius of curvature that is large relative to that of its rear face which has a hemispherical formation, and a double-concave lens behind the meniscus having radii and a diameter substantially greater than those of the rear face of the meniscus, said second assembly comprises a series of five identical lenses, the successive distance between these lenses being slightly less than twice their focal length, the first lens being the entry and the fifth lens being the exit of the second assembly.

4,257,671

FIXED OPTICAL ATTENUATOR FOR LIGHT RAYS GUIDED BY OPTICAL FIBRES

Alain Barbaudy, Montreuil, and Jacques Galaup, Gravigny-Longjumeau, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Mar. 26, 1979, Ser. No. 23,915
Claims priority, application France, Apr. 14, 1978, 78 11048
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.15 **3 Claims**



1. A fixed optical attenuator for light rays guided by optical fibres, said fixed optical attentuator comprising:

an attenuator element formed by an organic or an inorganic medium which is transparent to the wavelength of the light rays and which is doped with one or more substances which have an absorption band at said wavelength;

two graded refractive index lenses with plane faces, in axial alignment with each other and and separated by said attenuator element; and

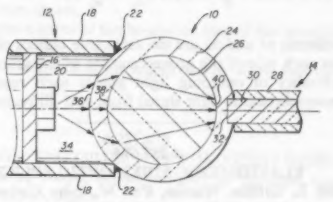
a short optical fibre disposed on each side of the assembly formed by said lenses and said attenuator element with said optical fibres in axial alignment with said lenses.

4,257,672

OPTICAL COUPLER FOR CONNECTING A LIGHT SOURCE TO AN OPTICAL TRANSMISSION LINE

Layton Balliet, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1978, Ser. No. 973,939
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.17 **14 Claims**



1. An optical coupler for coupling a relatively wide emission light source to an optical transmission line having a relatively small cross sectional area comprising:

a lens structure that is transparent to light and is comprised of a core region having a first index of refraction and a shell region enclosing said core region and having a second index of refraction, the first index of refraction being greater than the second index of refraction;

means for mounting the relatively wide emission light source adjacent one side of said lens structure for impinging the light rays from the light source upon said lens structure, the light rays being refracted towards the optical transmission line by said lens structure; and

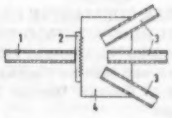
means for coupling the optical transmission line to the opposite side of said lens structure from the wide emission light source for receiving light.

4,257,673

DEVICE FOR COUPLING AT LEAST THREE LIGHT GUIDES

Pieter Matthijsse, Bergschenhoek, Netherlands, assignor to De Staat der Nederlanden, Te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegraphie en Telefonie, Hague, Netherlands

Filed Dec. 18, 1978, Ser. No. 970,333
Claims priority, application Netherlands, Dec. 22, 1977, 7714270
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.19 **7 Claims**



1. A device for intercoupling a monochromatic light signal in one light guide with at least two other light guides simultaneously, by the amplitude division method comprising:

a first light source transmitting a monochromatic light signal, which is coupled into

a thin diffraction grating with a thickness profile that meets the condition

$$d - s(x) < \frac{n^2}{16\,\lambda\,\{F + |\,\Delta f(x)\,|\,\}^2},$$

wherein d is the maximum thickness of the diffraction pattern, x is any point along the diffraction pattern, s(x) is

the thickness profile along the x axis, n is the refractive index of the grating, λ is the wave length, F is the upper cut-off spatial frequency for emerging light, and $|\Delta f(x)|$ is a measure for the frequency shift occurring as a consequence of the slope of the diffraction pattern.

and a cut-off frequency that meets the condition

$$\frac{1}{F} > 4\left[\lambda d\left(\frac{1}{n_1}+\frac{1}{n_2}\right)\right]^{\frac{1}{2}},$$

wherein n1 and n2 are the refractive indices of the media on each side of the groved surface of the grating; and

a plurality of outgoing light guides each receiving said monochromatic light signal from said diffraction grating.

4,257,674

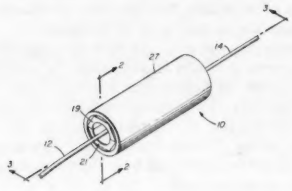
ELASTOMERIC FIBER OPTIC SPLICE

Wendell L. Griffin, Warren, Pa.; W. John Carlsen, Natick, Mass., and John E. Benasutti, Oil City, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 23, 1979, Ser. No. 32,583

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.21 **8 Claims**



1. A splice for holding the ends of optical fibers in end to end relationship comprising a fiber receiving member having an external polygonal shaped surface and formed by a pair of sections, said sections having complimentary and mating planar surfaces in engagement, only one of said planar surfaces having an axially aligned groove therein and facing the other of said planar surfaces to form an opening therewith, said fiber receiving member comprising an elastomeric material of sufficient resilience to permit said opening to expandably receive optical fibers dimensioned larger than said opening, and a cylindrically shaped sleeve mounted about said receiving member for holding said sections in assembled relationship.

4,257,675

OPTICAL-FIBER SUBMARINE CABLE AND MANUFACTURING METHOD THEREOF

Yukio Nakagome; Yasuhiko Niiro, both of Yokohama; Hiroharu Wakabayashi, Tokyo, and Makoto Nunokawa, Kawasaki, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1979, Ser. No. 22,143

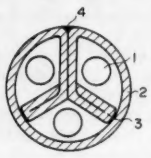
Claims priority, application Japan, Mar. 31, 1978, 53/36579

Int. Cl.³ G02B 5/16

U.S. Cl. 350—96.23 **2 Claims**

1. An optical-fiber submarine cable comprising:

a combination body formed, as one body, from a sheet-like tape into a cylindrical-pressure resisting sheath and a reinforcing member of a cross section extending longitudinally in the cylindrical pressure-resisting sheath by curving inwardly both marginal longitudinal edge portions of the sheet-like tape, said reinforcing member having a cross section composed of at least three radial portions extending radially from the center thereof in the cylindrical pressure resisting sheath so as to provide at least three longitudinally extending spaces separated by said at least three portions, the marginal longitudinal edge portions of the cylindrical pressure resisting sheath being joined together, and



at least one low-loss optical fiber extending longitudinally in each of said at least three longitudinally extending spaces.

4,257,676

DEVICE FOR COLLECTING LIGHT

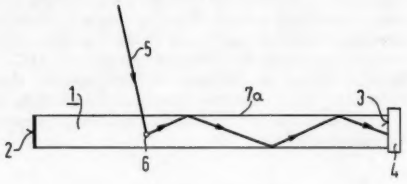
Waldemar Greubel, and Ferdinand Quella, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 1, 1979, Ser. No. 62,734

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1978, 2833926

Int. Cl.³ G02B 5/14; H01L 31/00

U.S. Cl. 350—96.34 **9 Claims**



1. A device for collecting light comprised of a body functioning as a light trap and having at least one light exit window, said body being comprised of a solid carrier material having an index of refraction greater than one and containing therein substantially uniformly dispersed fluorescent particles which have finite dipole moments with different values in the basic state and in the excited state of said particles, said carrier material being a polar water-containing amorphous medium based on a material selected from the group consisting of a polysilicate and a polyphosphate.

4,257,677

RETROVIEWER

John P. Anderson, Ontario, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed Oct. 29, 1979, Ser. No. 89,533

Int. Cl.³ G02B 27/14

U.S. Cl. 350—174 **12 Claims**

1. Apparatus for viewing an article having a retro-reflective legend bearing layer affixed thereto, comprising

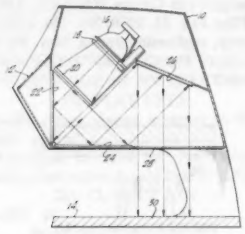
a light source capable of producing a substantially collimated light beam,

a beamsplitter inclined at an angle to said light beam and positioned so that said light beam impinges thereon and is partially reflected thereby,

a first plane mirror inclined at an angle to said beamsplitter and positioned to receive said partially reflected light beam from said beamsplitter, and

a second plane mirror inclined at an angle to said first plane mirror and positioned to receive said light beam upon reflection thereof from said first plane mirror and to reflect said light beam onto an article to be viewed, so that said light beam upon retroreflection by the retro-reflec-

tive layer of such an article is reflected via said second plane mirror and said first plane mirror back to said beam-



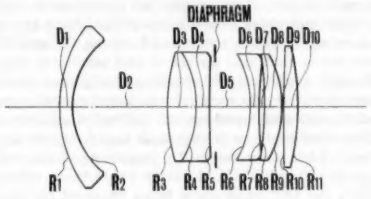
splitter and is partially transmitted thereby for reception by an observer.

4,257,678

WIDE ANGLE PHOTOGRAPHIC LENS

Kikuo Momiyama, and Hideo Yokota, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1978, Ser. No. 941,171
Claims priority, application Japan, Sep. 14, 1977, 52-110940
Int. Cl.[3] G02B *9/60*
U.S. Cl. 350—465 **7 Claims**



1. A wide angle photographing lens comprising:
first lens means being a negative meniscus lens with a convex surface to be directed toward the object;
second lens means having a positive doublet consisting of a bi-convex lens and a negative lens cemented to each other;
third lens means having a bi-concave lens arranged at the object end of the second lens means;
fourth lens means having a positive meniscus lens with a convex surface toward the image and arranged at the image end of the third lens means;
fifth lens means having a positive lens the absolute value of whose radius of curvature of lens surface at the object end is larger than that at the image end and arranged at the image end of the fourth lens means;
a diaphragm between the second lens means and the third lens means,
the lens and lens means satisfying the conditions:

$$0.9522f \leqq L \leqq 1.1836f$$

$$1.5980f \leqq |f_1| \leqq 1.9713f \quad (f_1<0)$$

$$0.2184 \leqq \frac{R_1 - R_2}{R_1 + R_2} \leqq 0.3012$$

$$\frac{0.3577}{f} \leqq \frac{N_3 - N_2}{R_4} \leqq \frac{0.4702}{f}$$

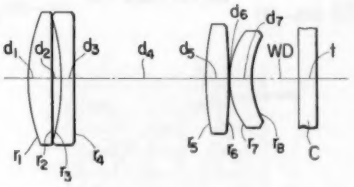
wherein
f: Focal length of the total system
L: Distance between the first lens surface and the last lens surface along the axis
f_1: Focal length of the first lens
R_1: Radius of curvature of the surface at the object side of the first lens
R_2: Radius of curvature of the surface of at the image side of the first lens means
R_4: Radius of curvature of the cemented surface of the second lens means
N_2: Refractive index of the bi-convex lens of the second lens means
N_3: Refractive index of the negative lens of the second lens means.

4,257,679

REPRODUCING OBJECTIVE FOR VIDEO DISKS

Kaneyas Okawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1979, Ser. No. 64,870
Claims priority, application Japan, Aug. 17, 1978, 53-99458
Int. Cl.[3] G02B *9/34*
U.S. Cl. 350—469 **8 Claims**



1. A reproducing objective for video disks comprising a first, second, third and fourth lenses, said first lens being a plano-convex lens, said second lens being a plano-concave lens, said third lens being a positive lens, said fourth lens being a positive meniscus lens, said reproducing objective for video disks satisfying the following conditions:
(1) $1.7f > f_1 > 2.1f$
(2) $-4.3f > f_2 > -3.5f$
(3) $1.4f > f_4 > 1.9f$
(4) $r_2 = \infty$
(5) $r_4 = \infty$
(6) $0.5f > r_8 > 1.7f$
(7) $d_2 > 0.1f$
(8) $0.6f > d_4$
wherein reference symbol f represents the focal length of the lens system as a whole, reference symbols f_1, f_2 and f_4 respectively represent the focal lengths of the first, second and fourth lenses, reference symbol r_2 represents the radius of curvature of the surface on the disk side of the first lens, reference symbol r_4 represents the radius of curvature of the surface on the disk side of the second lens, reference symbol r_8 represents the radius of curvature of the surface on the disk side of the fourth lens, reference symbol d_2 represents the airspace between the first and second lenses, and reference symbol d_4 represents the airspace between the second and third lenses.

4,257,680

MIRROR ASSEMBLY FOR PATIENTS WITH PERSONAL HYGIENE PROBLEMS

Joseph S. Baczkowski, 207 Piper, Detroit, Mich. 48215

Filed Aug. 6, 1979, Ser. No. 63,713
Int. Cl.[3] G02B *7/18*
U.S. Cl. 350—298 **6 Claims**

1. A mirror assembly for adjustable mounting on the thigh of a human patient and when mounted being movable with the thigh, comprising a sustantially rectangular thin elastically bendable support plate, a mirror, means mounting the mirror

on the plate for pivotal adjustment about an axis transverse to the length of the plate, strap means for removably but tightly securing the plate to the thigh of a patient, when mounted on

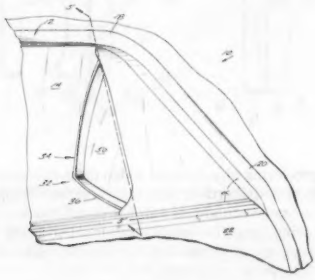
said thigh said plate being elastically curved about an axis normal to its length whereby it substantially conforms temporarily to the curvature of the thigh.

4,257,681

AUTOMOTIVE REAR VIEW MIRROR

Henry d.S. Lauve, Troy, Mich., assignor to Electric Fuel Propulsion Corp., Troy, Mich.

Filed Oct. 23, 1979, Ser. No. 87,624
Int. Cl.³ G02B 7/18
U.S. Cl. 350—307 **11 Claims**



1. An outside rear view mirror for a vehicle having a side window relative to a principal direction of motion, which side window is framed at a front corner by two framing elements which meet at an angle,

said mirror comprising:

a cowl including forwardly, upwardly, outwardly and downwardly presented outer wall means collectively of streamlined configuration relative to said principal direction of motion;

said cowl further including inner side wall means having two mounting flange means provided thereon, one located to be secured to one of said window framing elements and the other located to be secured to the other of said window framing elements with the cowl laterally juxtaposed with said side window at said front corner;

a reflecting mirror body mounted on said cowl behind said wall means collectively of streamlined configuration, and including a generally rearwardly presented reflecting surface;

said outer wall means of said cowl converging forwardly and downwardly with said two mounting flange means extending from said inner side wall means at an acute angle relative to one another, thus configuring said outside rear view mirror to be used at the lower front corner of said side window; and

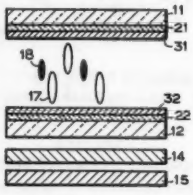
said cowl wall means comprising a three-faced generally tetrahedral body having a rearwardly open side for a mouth, said reflecting mirror body being disposed in said mouth.

4,257,682

LIQUID CRYSTAL COLOR DISPLAY CELL

Takaharu Suzuki, Tokyo, and Hiroshi Shimizu, Kawagoe, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1978, Ser. No. 879,519
Claims priority, application Japan, Mar. 18, 1977, 52/30025
Int. Cl.³ G02F 1/133
U.S. Cl. 350—349 **5 Claims**



1. A liquid crystal device comprising:

(a) a pair of upper and lower opposed substrates with a space therebetween, each formed of a glass plate;

(b) transparent electrodes each disposed on the inside surface of each of said substrates;

(c) a negative dielectric anisotropic nematic liquid crystal layer disposed between said substrates and containing a dichroic coloring agent and a chiral material having a left or right directional property;

(d) each surface of said substrates treated such that liquid crystal molecules of said liquid crystal layer are oriented at an angle within a range of between 60° and 90° with respect to each said surface of said substrates; and

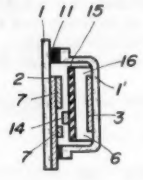
(e) a twist angle formed between an inclination direction of said liquid crystal molecules adjacent to said upper substrate and said liquid crystal molecules adjacent to said lower substrate such that said liquid crystal layer has twisted-like structure in the presence and absence of an applied electric field, the twist angle being substantially 180°, the 180° twist angle being obtained by said chiral material having a left or right directional property.

4,257,683

ELECTROCHROMIC DISPLAY

Hiroshi Kuwagaki, Jyoyo; Hiroshi Hamada, Tenri; Sadatoshi Takechi, Tenri, and Kohzo Yano, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 23, 1979, Ser. No. 5,682
Claims priority, application Japan, Jan. 24, 1978, 53-6956
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 **8 Claims**



1. An electrochromic display capable of forming a display image thereon, comprising:

a pair of opposing electrodes;

electrochromic material interposed between said pair of opposing electrodes, manifesting an electrochromic phenomenon when a voltage is applied thereto; and

a display pattern member disposed between said pair of opposing electrodes, said display pattern member having a

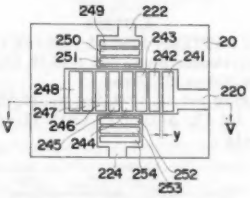
display pattern printed thereon, wherein the electrochromic phenomenon takes place in association with said display pattern on said display pattern member to form said display image.

4,257,684

ELECTROCHROMIC SEGMENTS FORMED ON A DISPLAY ELECTRODE IN AN ELECTROCHROMIC DISPLAY CELL

Mitsuru Nishiyama, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 13, 1979, Ser. No. 11,916
Claims priority, application Japan, Feb. 16, 1978, 53-19167[U]
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 **7 Claims**



1. An electrochromic display cell which includes at least one display electrode for displaying a desired pattern by selectively coloring or bleaching said display electrode, a counter electrode, and an electrolyte disposed between said display electrode and said counter electrode, said display electrode comprising:

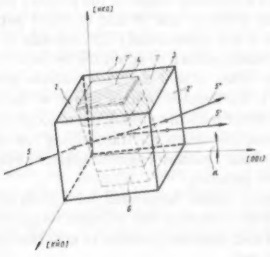
a continuous electrode; and an electrochromic layer formed on said continuous electrode, said electrochromic layer including a plurality of segments, each of which being spaced apart from the adjacent segment with a thin gap formed therebetween.

4,257,685

ACOUSTO-OPTIC DEVICE

Cestmir Barta; Jiri Ctyroky, both of Prague, Czechoslovakia; Iraida M. Silvestrova, and Jurij V. Pisarevskij, both of Moscow, U.S.S.R., assignors to Ceskoslovenska Akadamie ved, Prague, Czechoslovakia and Akademija Nauk SSSR, Moscow, U.S.S.R.

Filed Jan. 25, 1979, Ser. No. 6,498
Claims priority, application Czechoslovakia, Feb. 3, 1978, 715-78
Int. Cl.³ G02F 1/29
U.S. Cl. 350—358 **5 Claims**



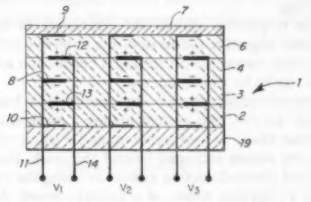
1. An acousto-optic device comprising a single crystal of pure or mixed univalent mercury halide, characterized by having a first face provided with a source of acoustic wave, a pair of opposite faces polished for the entrance and exit of light waves, one of said polished faces being perpendicular to a direction inclined from the optical axis of the crystal [001] about the crystallographic direction [KHO] by an angle (α), said first face being inclined by the same angle (α) from the crystallographic plane (HKO) about the crystallographic direction [KHO] and being provided with a source of transverse acoustic waves vibrating in the [KHO] direction.

4,257,686

MULTIPLE LAYER PIEZOELECTRIC WAVEFRONT MODULATOR

Nedo P. Albertinetti, Canton, and Ralph E. Aldrich, Acton, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Dec. 14, 1978, Ser. No. 970,055
Int. Cl.³ G02F 1/00
U.S. Cl. 350—360 **6 Claims**



1. In a piezoelectric wavefront modulator, comprising:

a. a unitary block of piezoelectric medium (**1**) which undergoes dimensional changes in response to electric fields produced therein;

b. a mirror (**7**) coupled to said unitary block of piezoelectric medium;

c. means for providing said piezoelectric medium with a plurality of discretely electrically-addressable locations (V_1, V_2, V_3);

d. means for addressing each discretely electrically-addressable location with a variable strength voltage (**11, 14**), the resulting field being sufficient at each location to cause the piezoelectric medium to undergo deformation which is capable of correcting distortion in a wavefront striking said mirror; the improvement wherein:

e. said unitary block of piezoelectric medium comprises layers of material (**2, 3, 4,** and **6**), each layer having uniform piezoelectric properties throughout, and said means for addressing each discretely electrically-addressable location within said unitary piezoelectric medium further includes:

e-1. a first set of electrodes (**8, 9,** and **10**) at each of said addressable locations positioned at one side of each of said layers;

e-2. a second set of electrodes (**12, 13**) at each of said addressable locations positioned at an opposite side of each of said layers;

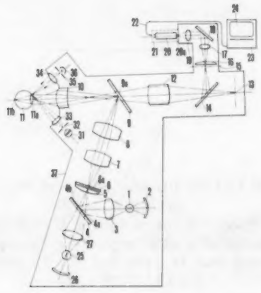
e-3. a first conductor (**11**) coupled to said first set of electrodes at each location;

e-4. a second conductor (**14**) coupled to said second set of electrodes at each said location, thereby to increase the sensitivity, and decrease the requisite driving voltage applied to each of said addressable locations.

4,257,687
EYE EXAMINING INSTRUMENT WITH PHOTO-DETECTING SYSTEM

Yoshimi Kohayakawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1978, Ser. No. 893,525
Claims priority, application Japan, Apr. 12, 1977, 52/41721
Int. Cl.[3] A61B *3/14;* G03B *29/00*
U.S. Cl. 351—7 **8 Claims**



1. An eye examining instrument with photo-detecting system comprising:

an eye inspecting system for inspecting an eye including optical objective means opposite to an eye to be examined;

projection means for projecting a beam from an indicium to the eye to be examined; and

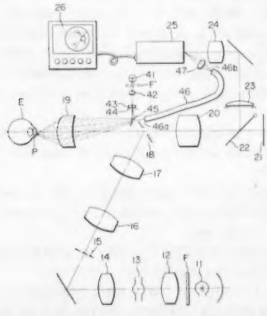
a photo-detecting system for receiving a beam reflected from the eye, said system having a mask with an area of similar shape as said indicium and a photo-electric transducing means arranged behind the mask, the optical axis of said photo-detecting system crossing the optical axis of said projecting means at a predetermined distance from said eye inspecting system,

said photo-electric transducing means producing an electrical signal equal to a predetermined signal when the distance between the eye and said eye examining instrument is proper, and producing a different electrical signal when the distance is erroneous.

4,257,688
EYE EXAMINING INSTRUMENT

Isao Matsumura, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1978, Ser. No. 906,081
Claims priority, application Japan, May 19, 1977, 52-57941
Int. Cl.[3] A61B *3/14, 3/10;* G03B *29/00*
U.S. Cl. 351—7 **20 Claims**



1. An image examining instrument comprising:

an eye inspecting system;

a mark;

a prism for splitting an image of the mark into plural mark images;

a beam projection system for projecting beams for forming an image of the mark at an anterior portion of the eye;

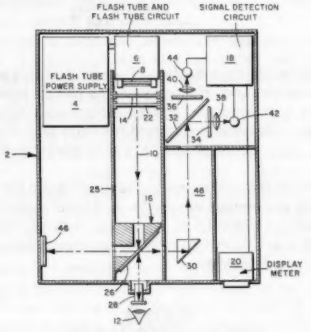
imaging optical means, directed at the anterior portion of the eye for imaging the beams reflected by said anterior portion; and

a mark detecting system for detecting the positions of a plane which is in conjugate relationship with said anterior portion of the eye with respect to said imaging optical means, said mark and said prism being so arranged that when positioning of the eye and instrument is correct, the mark images are aligned.

4,257,689
PULSE PATTERN VISUAL ACUITY DEVICE

Don R. Yancey, chateau Brown 305, 6-26-38, Kita-Karasuyama, Setagaya-ku, Tokyo 157, Japan

Filed Jul. 16, 1979, Ser. No. 58,025
Int. Cl.[3] A61B *3/10;* G01N *21/41*
U.S. Cl. 351—13 **34 Claims**



1. A visual acuity device for measuring the visual acuity of a patient's eye comprising:

light source means for generating a beam of light;

optical means for transmitting the beam of light from said light source means to the patient's eye and transmitting light reflected by the patient's eye, said optical means including a primary pattern adjacent said light source means in the optical path of the beam of light, said primary pattern having a pattern of transparent and non-transparent portions which is observed by the patient's eye to result in a reflected image of the primary pattern, a pair of analyzer patterns, one of said analyzer patterns having a pattern which substantially corresponds to the pattern of said primary pattern to admit the in-focus reflected image and the other of said analyzer patterns having a pattern which is the negative mirror image of the pattern of said one analyzer pattern to block the in-focus reflected image, and reflection means for transmitting the reflected image of the primary pattern from the patient's eye to said pair of analyzer patterns;

photoelectric means associated with each of said analyzer patterns for detecting the reflected image passing through each of said analyzer patterns to generate light responsive signals; and

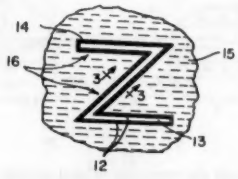
signal detection means connected to said photoelectric means for detecting the difference in the light responsive signals of said photoelectric means for generating an output signal determinative of the visual acuity of the patient's eye.

4,257,690

EYE TESTING CHART

Bradford Howland, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 16, 1979, Ser. No. 30,455
Int. Cl.[3] A61B 3/02; G09F 13/16
U.S. Cl. 351—32 16 Claims



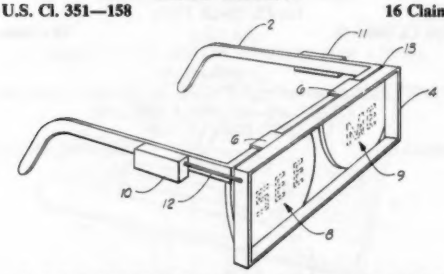
1. A line figure comprising at least one line stroke, each line stroke comprising line segments, with at least two of said line segments of different reflectances, each said line stroke being on a gray background, said gray background having the same average reflectance as the average reflectance of the line stroke, said line figure being composed of said line strokes whereby said figure blends into the gray background when said figure is at a distance beyond the resolution capability of a viewer.

4,257,691

LINE OF SIGHT DISPLAY APPARATUS

Philip A. Brooks, 436 NW. 46th Ter., Oklahoma City, Okla. 73118

Filed Jan. 5, 1979, Ser. No. 1,219
Int. Cl.[2] G02B 1/24
U.S. Cl. 351—158 16 Claims



1. A line of sight display apparatus for displaying visually perceptible matter by a displayer to a viewer while obscuring said displayed matter from the sight of said displayer without preventing normal vision by said displayer, comprising:

light-emitting imaging means disposed along the line of sight of said displayer between said viewer and said displayer for providing said visually perceptible matter;

blocking means disposed along the line of sight of said displayer between said imaging means and said displayer for providing an obscuring shield to prevent the observation of said visually perceptible matter by said displayer when said imaging means is providing said visually perceptible matter; and

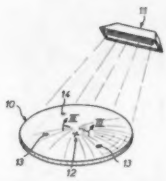
electrical activating means associated with said imaging means and said blocking means for periodically electrically activating said imaging means to provide said visually perceptible matter and for simultaneously periodically electrically activating said blocking means to provide said obscuring shield.

4,257,692

METHOD OF MARKING OPHTHALMIC LENSES OF ORGANIC MATERIAL AND LENSES SO MARKED

Lyliane Le Naour-Sene, Vincennes, France, assignor to Essilor International "Cie Generale d'Optique, Creteil, France

Filed Oct. 13, 1978, Ser. No. 951,264
Claims priority, application France, Oct. 14, 1977, 77 30928
Int. Cl.[3] D06P 3/00; G02C 7/02
U.S. Cl. 351—159 11 Claims



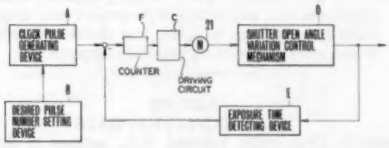
10. An ophthalmic lens of organic material selected from the group consisting of poly [ethylene glycol di-allyl di-carbonate], polycarbonate, polymethyl methacrylate and transparent polyurethane and having at least one mark or indicia of thermally-transferred, sublimed optical brightener on a surface of the lens and anchored in the organic material constituting the lens.

4,257,693

CINE CAMERA

Noritsugu Hirata, Yokohama, and Hiroyuki Takimoto, Urawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1979, Ser. No. 10,397
Claims priority, application Japan, Feb. 14, 1978, 53-15527
Int. Cl.[3] G03B 9/12; G01D 5/36
U.S. Cl. 352—209 2 Claims



1. A cine camera comprising a rotary shutter having a plurality of shutter blades, a shutter open angle varying device, means for setting an exposure time, time signal forming means for producing a reference time signal corresponding to the time set by said exposure means, means for producing a signal corresponding to the opening and closing of the shutter, a detecting circuit receptive of said time signal and said shutter opening and closing signal for detecting the exposure time of the shutter, and driving means responsive to the output of said detecting circuit for driving said shutter open angle varying device.

4,257,694

PROJECTION SYSTEM

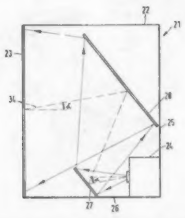
Freisleben Reinhard, Pöring, Fed. Rep. of Germany, assignor to Soding TV GmbH & Co. Bild & Ton International, Fed. Rep. of Germany

Filed Jan. 31, 1979, Ser. No. 7,945

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804704

Int. Cl.[3] **G03B** *21/10, 21/28*

U.S. Cl. 353—78 **14 Claims**



1. A projection system having a compressed optical path for projecting diapositive film strips comprising:

a projection box having a plurality of walls including one wall in the form of a ground glass plate and at least another wall transversely disposed to said one wall, said one wall in the form of a ground glass plate acting as a screen for rear view projections;

projector means for providing a projection beam having a principal ray, said projector means being disposed adjacent to said another wall at a location thereon remote from said one wall and including illumination means for generating said projecting beam and an objective having a relatively short focal length for focusing an image being projected upon said one wall, said illumination means having an optical axis along which said principal ray is produced and said objective having an optical axis, an optical center and an imaging cone for incoming radiation provided by said illumination means, said objective having said optical axis thereof parallelly disposed to said another wall and transversely disposed to said one wall and said illumination means being positioned having said optical axis thereof being inclined toward said another wall in a direction in which said principal ray is produced and passing through said optical center of said objective to form an acute angle with said optical axis of said objective and said another wall, said acute angle being limited to enable said projecting beam from said illumination means to be substantially within said imaging cone for incoming radiation; and

first and second reflecting mirrors being disposed within said projection box and arranged to project said projecting beam upon said one wall, said first and second reflecting means being substantially parallelly disposed.

4,257,695

FILM PROJECTION GATE

Harold F. Langworthy, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 19, 1979, Ser. No. 21,757

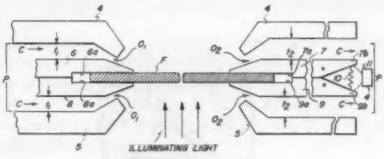
Int. Cl.[3] **G03B** *1/52, 21/16*

U.S. Cl. 353—95 **8 Claims**

1. In projection apparatus of the type having a projection zone at which an image-bearing film is subjected to illuminating radiation for image projection, an improved projection gate comprising

(a) means for supporting such film in said projection zone; and

(b) means defining a first fluid conduit for directing cooling fluid from a source location, spaced from said projection zone, to a discharge location extending along an edge portion of said projection zone, said conduit defining means including at such discharge location a first wall contiguous film supported at said projection zone and a second wall spaced from said first wall so as to define a fluid discharge orifice, said first wall extending toward the



film beyond the terminus of said second wall and being configured so that fluid egressing said orifice exhibits Coanda effect attachment to a major surface of the film at a location substantially at, or upstream from, said edge portion of said projection zone.

4,257,696

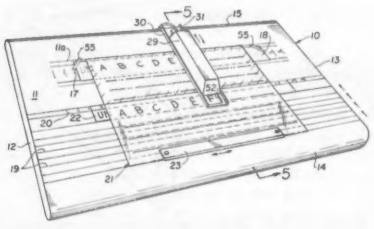
PHOTOGRAPHIC PRINTING APPARATUS

Albert F. Kronman, Locust Valley, N.Y., and Philip E. Hensy, Plantation, Fla., assignors to Visual Graphics Corporation, Tamarac, Fla.

Filed Nov. 19, 1979, Ser. No. 95,153

Int. Cl.[3] **B41B** *17/06*

U.S. Cl. 354—14 **10 Claims**



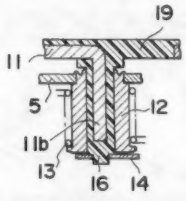
1. A photographic printing apparatus comprising a substantially rectangular housing, a plannar top portion on said housing, a first strip of photosensitive material removably secured to the top portion, a second strip of photosensitive instant imaging material spaced from the first strip and removably secured to the top portion, a film font having a first positive symbol forming porion and a second negative symbol forming portion secured to and freely slidable across the top portion overlying the first and second strips, an image exposure assembly carried by the housing above the two strip materials and horizontally and vertically slidable across the housing top portion, at least one flash bulb in said image exposure assembly and switch means for activatingthe flash bulb to direct light through selected portions of the first and second portions of the film font upon the first and secondstrips to form a latent and an instantly visible image on said first and second strips respectively.

4,257,697

PROJECTING MEMBER CARRIED BY THE BASE PLATE FOR CAMERAS

Keiji Yamazaki, and Toshio Kobori, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 17, 1979, Ser. No. 76,036
Claims priority, application Japan, Sep. 19, 1978, 53-127638[U]
Int. Cl.³ G03B 17/00, 19/12
U.S. Cl. 354—152 14 Claims



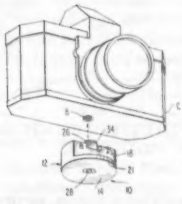
1. A motion transmission mechanism comprising a base plate, a pivot member located on and projecting outwardly from said base plate and a rotatable member rotatably supported on said pivot member ,said mechanism being characterized in that said pivot member includes a core defining tongue cut and bent from and integral with said base plate and a synthetic polymeric resin sheath at least partially enveloping said tongue and having a cylindrical circumferential face along at least part of the length thereof, and being anchored against axial movement along said tongue.

4,257,698

CASSETTE FILM TYPE INDICATOR FOR A STILL CAMERA

Raymond J. Bresell, 18 Moody Ave., Claremont, N.H. 03743

Filed Jan. 8, 1980, Ser. No. 110,316
Int. Cl.³ G03B 17/00
U.S. Cl. 354—289 5 Claims



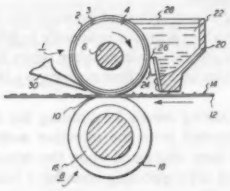
1. A cassette film type and frame minder for a still camera, said minder comprising: a minder body, a means for attaching said body to said camera, laterally opposed faces on said body, a marker arm pivotally mounted on each face for sweeping across the face thereof, a set of marks carried by each face at circumferential spaced positions relative to the arc sweep of said marker, one of said sets of marks comprising indicia identifying given numbers of film frames for said camera carried cassette and said other set of marks comprising indicia indicative of the specific type of film within said cassette.

4,257,699

METAL FILLED, MULTI-LAYERED ELASTOMER FUSER MEMBER

James A. Lentz, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1979, Ser. No. 26,869
Int. Cl.³ B05C 11/02; B21B 31/08
U.S. Cl. 355—3 FU 53 Claims



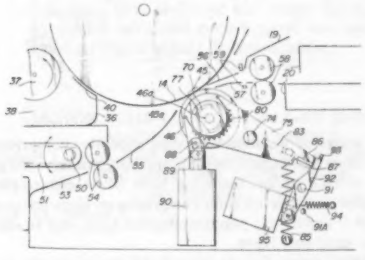
45. In a heated pressure fusing system for fusing toner images in an electrostatic reproducing apparatus in which a fuser roll and a backup roll define a contact arc to fuse toner images onto a substrate and a release agent is applied to the working surface of the fuser roll to prevent toner offset upon the fuser roll, the improvement comprising a fuser roll having a cylindrical base member, at least one base layer of elastomer adhered to the base member, said base layer elastomer optionally having a metal-containing filler dispersed therein, and an outer layer of an elastomer coated upon the base layer elastomer, said outer layer elastomer having a metal-containing filler dispersed therein; the release agent applied upon the working surface of outer layer elastomer being a polymeric release agent having functional groups which interact with the metal in the metal-containing filler.

4,257,700

ELECTROPHOTOGRAPHIC APPARATUS

Hiroshi Tsuda, Mitaka; Kiyoshi Miyashita; Masaji Nishikawa, both of Hachioji; Akira Shimizu, Fuchu, and Muneo Kasuga, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1979, Ser. No. 30,624
Claims priority, application Japan, Apr. 18, 1978, 53/46181; Jan. 26, 1979, 54-7799
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 TR 6 Claims



1. A transfer device for use in an electrophotographic apparatus for printing one or more copies of a document to be duplicated by transferring a toner image formed on a retentive member onto a record paper, comprising:

a transfer roller for transferring the toner image onto the record paper, while the record paper is pressed against the retentive member;

a pair of swingable arms for rotatably supporting the transfer roller and assuming a first position in which the transfer

roller is urged against the retentive member and a second position in which the transfer roller is separated from the rententive member;

a first spring means for resiliently displacing the supporting arms into the first position;

a solenoid coupled with the supporting arms for driving the arms into the second position upon an occurrence of a paper jam, so that the transfer roller is separated from the retentive member;

a second spring means arranged between the transfer roller and the supporting arms for resiliently urging the transfer roller against the retentive member when the supporting arms are driven into the first position by the first spring means; and

a mechanical locking means for holding the transfer roller which is separated from the retentive member after the solenoid has been energized upon the occurrence of the paper jam and the supporting arms have been driven into the second position.

4,257,701

IMAGE INFORMATION RECORDING APPARATUS

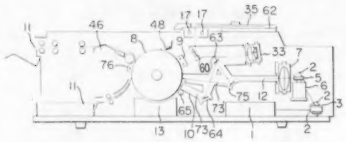
Kazuhiro Hirayama, Yokohama; Yasushi Sato, Kawasaki; Noritaka Mochizuki, Yokohama, and Katsumi Masaki, Kodaira, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 850,348, Nov. 10, 1977, Pat. No. 4,122,462, which is a continuation of Ser. No. 611,783, Sep. 9, 1975, abandoned. This application Aug. 22, 1978, Ser. No. 935,987

Claims priority, application Japan, Sep. 11, 1974, 49-104738; Sep. 13, 1974, 49-105631; Oct. 1, 1974, 49-112925; Jan. 24, 1975, 50-10286

Int. Cl.³ G03G *15/28*

U.S. Cl. 355—8 **16 Claims**



1. An image information recording apparatus comprising:

first corona discharge means for applying primary charge to the surface of the insulating layer of an electro-photographic sensitive medium comprising an electrically conductive substrate, a photoconductive layer, and an electrically insulative layer;

first optical means for causing a first light image of a modulated laser beam to scan over said insulating layer for exposure;

second corona discharge means for applying to said insulating layer a corona discharge having at least a component of opposite polarity to that of said primary charge; and

second optical means for effecting a second light image exposure after said first exposure by said first optical means and after operation of said second corona discharge means at a position associated with the position of the first light image exposure to form an overlaid image.

4,257,702

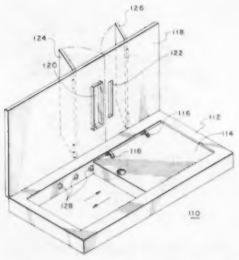
APPARATUS FOR ASCERTAINING COLOR BALANCE OF PHOTOGRAPHIC PRINTING PAPER

Bertram W. Miller, Apartado Postal 316, Chapala, Jalisco, Mexico

Division of Ser. No. 812,808, Jul. 5, 1977, Pat. No. 4,166,701. This application Feb. 16, 1979, Ser. No. 12,665

Int. Cl.³ G03B *27/72*

U.S. Cl. 355—71 **4 Claims**



1. An easel for making exposures of selected portions of a sample sheet of photographic printing paper comprising:

a single optical wedge of linear density gradient and,

positioning means for selectively positioning the optical wedge in relation to the printing paper to form a plurality of separate spaced apart images of the optical wedge on the printing paper.

4,257,703

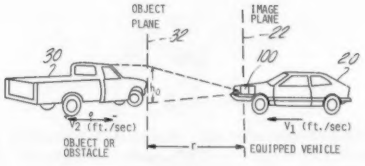
COLLISION AVOIDANCE USING OPTICAL PATTERN GROWTH RATE

George W. Goodrich, Bloomfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 15, 1979, Ser. No. 20,769

Int. Cl.³ G01C *3/08*; G01B *11/00*

U.S. Cl. 356—4 **20 Claims**



20. A collision avoidance system, carried by a first vehicle, for generating a collision avoidance signal in accordance with the relative motion between the first vehicle and an object, including a non-cooperating second vehicle, disposed at a distance r and having a velocity $\dot{r}$ relative to the first vehicle, the system comprising:

first means adapted to be carried by the first vehicle for transducing a signal indicative of the size of said object;

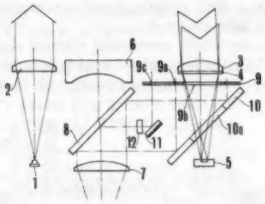
processor means responding to said first means for generating a collision avoidance signal indicative of the ratio of $\dot{r}/r$; and

means responsive to said collision avoidance signal for generating a signal to initiate corrective action.

4,257,704
DISTANCE MEASURING FINDER

Hideo Yokota, Yokohama, and Hideo Tamamura, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1979, Ser. No. 35,810
Claims priority, application Japan, May 12, 1978, 53-56258
Int. Cl.[3] G01C 3/04
U.S. Cl. 356—8 5 Claims



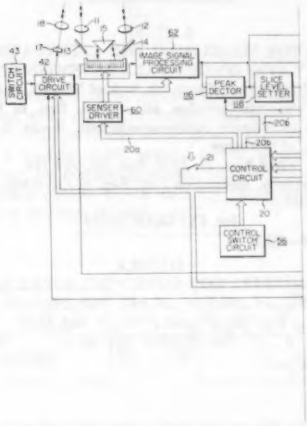
1. A distance measuring finder comprising:
(a) light emitting means for producing infrared light;
(b) a light projecting optical system for projecting the infrared light from said light emitting means onto an object being photographed;
(c) light receiving means for receiving the reflected light from the object to measure a distance to the object;
(d) a light receiving optical system for directing the reflected light from the object to said light receiving means;
(e) an objective lens for a finder arranged between said light projecting optical system and said light receiving optical system;
(f) an eyepiece lens arranged on a common optical axis of said objective lens;
(g) a field framing plate arranged near either one of said two optical systems, said plate having frame marks, a distance measuring portion indicating mark and an opening through which light from said one optical system passes;
(h) a reflection mirror incliningly disposed behind said field framing plate, said reflection mirror reflecting light passing through said frame marks and having an opening through which a light bundle passing through said one optical system is passed;
(i) a half mirror incliningly disposed between said objective lens and said eyepiece lens, said half mirror directing the light transmitted through said objective lens to said eyepiece lens after having passed therethrough, and directing the light transmitted through the frame marks and reflected from said reflection mirror to said eyepiece lens after having been reflected therefrom; and
(j) another reflection mirror for directing light transmitted through said indicating mark to said half mirror.

4,257,705
DEVICE FOR FOCUS DETECTION OR DISTANCE DETECTION

Kazuya Hosoe, Machida; Yukichi Niwa, Yokohama; Tokuichi Tsunekawa, Yokohama; Mitsutoshi Owada, Yokohama; Noriyuki Asano, Kawasaki, and Makoto Masunaga, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1979, Ser. No. 22,368
Claims priority, application Japan, Mar. 23, 1978, 53-33476
Int. Cl.[3] G01C 3/00, 5/00; G03B 7/08
U.S. Cl. 356—1 14 Claims

1. A system comprising:
(A) means for forming one or more images of an object;
(B) means for receiving said one or more images to provide one or more electrical outputs indicative of said one or more images, said image receiving means being signal integration type image sensing means for providing, as the outputs thereof, one or more integrated image signal integrated within an integration time period;
(C) means for receiving and processing said one or more electrical outputs of said image receiving means to detect the imaging condition of said one or more images formed by said image forming means;
(D) means for locally illuminating said object to form an optical mark on said object;
(E) means for detecting whether or not said one or more electrical outputs of said image receiving means are sufficiently proper outputs to ensure accurate imaging condition detection by said processing means, said detection means producing a detection signal when said one or more electrical outputs of the image receiving means are out-

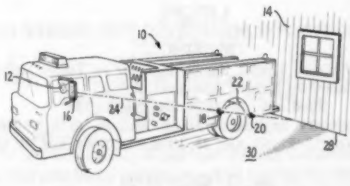


puts which cannot ensure accurate imaging condition detection by the processing means;
(F) said system further comprising means for controlling the integration time period of said image sensing means, said control means producing a control signal indicative of the integration time period of the sensing means;
(G) means responsive to said detection signal produced by said detection means to actuate said illuminating means, said actuating means being responsive to said control signal produced by said control means to actuate said illuminating means for a time period corresponding to the integration time period of said image sensing means in accordance with said control signal and said detection signal produced by said detection means.

4,257,706
MOTOR VEHICLE BACK-UP LIMIT GAUGING METHOD AND APPARATUS

Robert L. Smith, 3725 Walnut Ave., Concord, Calif. 94520

Filed Feb. 6, 1980, Ser. No. 119,040
Int. Cl.[3] G01C 5/00
U.S. Cl. 356—3 10 Claims



1. In a motor vehicle, the improvement comprising:
first line-of-sight indicating means affixed to said motor

vehicle in such a location as to be visible to the driver of the vehicle in the outside rear view mirror of the vehicle when the driver is seated in the driving position;

second line-of-sight indicating means affixed to said motor vehicle in such a location as to be visible to the driver of the vehicle in the outside rear view mirror of the vehicle when the driver is seated in the driving position and to be alignable with said first line-of-sight indicating means in said outside rear view mirror, thereby establishing a line-of-sight passing through said two line-of-sight indicating means and said outside rear view mirror;

said line-of-sight being so directed and located with respect to said motor vehicle as to pass through a predetermined point on a horizontal plane surface on which said vehicle is standing.

4,257,707

DEVICE FOR MEASURING THE ATTENUATION OF OPTICAL WAVES ON OPTICAL TRANSMISSION PATHS

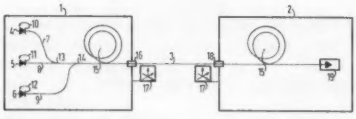
Heinrich Liertz; Ulrich Oestreich, both of Munich, and Guenter Zeidler, Unterpfaffenhofen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 21, 1978, Ser. No. 962,718

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 2752688

Int. Cl.³ G01N *21/84*

U.S. Cl. 356—73.1 **8 Claims**



1. A device for measuring the attenuation of optical waves on optical transmission paths designed with lightwave guides, said device comprising an optical transmitter having a connection for the lightwave guide to be measured and an optical receiver for receiving light from the optical transmitter after transmission via such a lightwave guide to be measured, said optical transmitter having at least two light sources of various wavelengths, said light sources having lightwave guides originating therefrom and having optical Y-coupler means for combining the lightwave guides originating from the light sources, and lightwave guide means for transmitting light from said optical Y-coupler means to the connector for transmission via a lightwave guide to be measured such that the light received by a lightwave guide to be measured essentially has the steady state mode distribution which would be present at the end of an optical transmission path of much greater length, said lightwave guide means having mode mixer and mode stripping means which excites multiple modes including said steady state mode distribution and then strips the jacket—and leakage modes from the optical waves transmitted thereby, said mode mixer and mode stripping means being connected between the light sources and the connector and being in the form of a lightwave guiding device.

4,257,708

APPARATUS FOR MEASURING THE DEGREE OF RINSING

Norisuke Fukuda, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 20, 1979, Ser. No. 31,738

Claims priority, application Japan, Apr. 28, 1978, 53/51650; Apr. 28, 1978, 53/51663; Apr. 28, 1978, 53/51664; Apr. 28, 1978, 53/51680

Int. Cl.³ G01N *21/26*

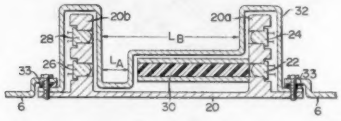
U.S. Cl. 356—435 **9 Claims**

1. An apparatus for measuring the degree of rinsing for use in a washing tub containing clothes to be washed and liquid in which a bubble detergent is dissolved and including stirring means for relatively moving said clothes and liquid, said apparatus comprising:

a light source disposed at the bottom of the washing tub to transmit light through the liquid;

a first photoelectric converting element disposed at the bottom of the washing tub to receive light emitted by said light source and having an optical path in said liquid for producing a first output signal corresponding to the amount of light received;

a second photoelectric converting element disposed at the bottom of the washing tub to receive light emitted by said light source and having an optical path in said liquid to



produce a second output signal corresponding to the amount of light received, said second photoelectric converting element being located at such position that the length of the optical path in said liquid between said light source and said second photoelectric converting element is longer than the length of the optical path in said liquid between said light source and said first photoelectric converting element;

circuit means including feedback means connected between said first photoelectric converting element and said light source so as to control the amount of light emitted thereby such that said first output signal will be constant; and

whereby said second output signal corresponds to the amount of said light transmitted through said liquid.

4,257,709

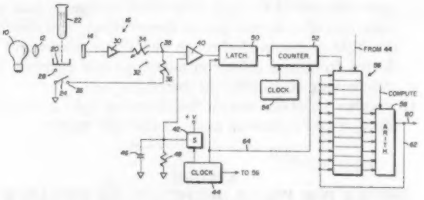
AUTOMATIC BLANKING CIRCUIT

William T. Mostyn, Jr., Waco, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Filed Dec. 26, 1979, Ser. No. 106,437

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—435 **12 Claims**



1. An optical system where light from a source is transmitted through a sample to measure the absorbance of light by the sample, the improvement of an automatic blanking circuit to continually compensate for variations in the intensity of the light received by a photodetector, such as those caused by age, deterioration, dirt or the like, comprising:

a source of reference voltage;

comparator means for comparing the reference voltage to the output of said photodetector;

an analog to digital converter for providing a digital value representative of the time during which the reference voltage exceeds the intensity of light received by said photodetector;

storage means for serially storing a first predetermined number of outputs from said analog to digital converter; and

means for averaging a second predetermined number of values in said storage means and providing an output; said second predetermined number being less than said first predetermined number.

4,257,710

CONTINUOUS PROCESS MIXING OF PULVERIZED SOLIDS AND LIQUIDS AND MIXING APPARATUS

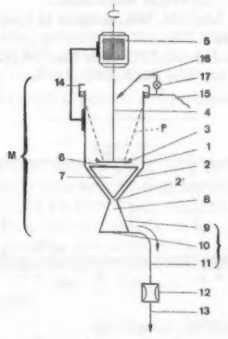
Adrien Delcoigne, Chantilly, and Jacques Lanneau, Breuil le Vert, both of France, assignors to Saint Gobain Industries, Neuilly, France

Filed Jan. 15, 1979, Ser. No. 3,416

Claims priority, application France, Feb. 8, 1978, 78 03473; Feb. 8, 1978, 78 03474; Feb. 8, 1978, 78 03475

Int. Cl.³ B28C *7/04, 5/38*

U.S. Cl. 366—8 **48 Claims**



1. A continuous process for mixing pulverized solids and liquids such as plaster powder and water characterized in that it comprises:

continuously introducing the liquid in a mixing container at a selected flow rate,

continuously introducing the pulverized solid in said container at a selected flow rate,

said flow rates being selected to provide a desired proportion of solid and liquid,

rotating the solid and liquid in the container in order to create a vortex thereof,

withdrawing the thus mixed solid and liquid from the container and controlling the rate of withdrawing such that a desired level of the mixture in the container is maintained, the mean stay time for the mixture in the mixing container being determined by the said level of the mixture in the container.

4,257,711

PROPORTIONAL SPACING IMPACT PRINTING APPARATUS

Yoshinori Nakajima, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 16, 1979, Ser. No. 12,902

Claims priority, application Japan, Feb. 20, 1978, 53-18207

Int. Cl.³ B41J *19/32*

U.S. Cl. 400—306 **6 Claims**

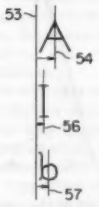
1. A proportional spacing printing apparatus including a carriage, printing element means carried by the carriage for printing a plurality of characters of different widths and carriage drive means for shifting the carriage, characterized by comprising:

memory means for storing a width parameter of a previous selected character;

detector means for detecting a width parameter of a present selected character;

computing means for computing a shift width as a predetermined function of the width parameters of the previous and present selected characters; and

control means for controlling the carriage drive means to shift the carriage by the shift width and subsequently control the printing element means to print the present selected character;



the width parameter of the previous selected character being a trailing width portion of the previous selected character and the width parameter of the present selected character being a leading width portion of the present selected character, the computing means comprising adder means for adding outputs of the memory means and detector means to produce the shift width.

4,257,712

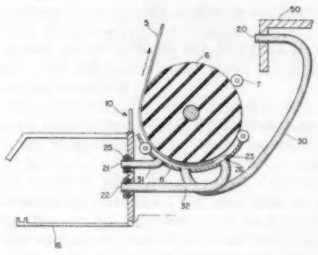
END OF PAPER INDICATOR FOR TYPEWRITERS

Francis G. McGuire, 6863 Elm St., McLean, Va. 22101

Filed Jun. 17, 1977, Ser. No. 807,631

Int. Cl.³ B41J *29/48*

U.S. Cl. 400—708 **4 Claims**



4. A wireless end of paper indicator for a typewriter consisting of a length of light piping formed to take a position in said typewriter between a typist viewing position and a sensing position that the end of a sheet of paper carried by an advancing roller in the typewriter takes near the exit of the sheet from the typewriter to thereby present to the sensing position a color contrast between the roller and the paper which in turn is viewed at the viewing position by transmission through said pipe.

4,257,713

CONICAL PEN

Alan E. Sherman, and Harold E. Koeln, both of St. Louis County, Mo., assignors to Penn Corporation, Princeton, N.J.

Filed Sep. 22, 1978, Ser. No. 944,765

Int. Cl.³ B43K *23/04*

U.S. Cl. 401—88 **7 Claims**

1. A pen comprising a case and writing mechanism in said case, said case being formed as a shell having one end substantially larger than the other with the writing mechanism located internally to project from the smaller end, said case tapering from the larger end to the small end about a central axis, said

larger end terminating in a generally circular end, one point on which locates the case so that when the generally circular end is resting on a surface, a line through said point which connects

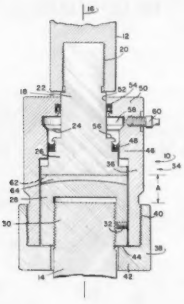
said point to the smaller end of the case is approximately perpendicular to said surface, the larger end being closed with a wall, said wall at the larger end interlocking with the case to position the wall in the case.

4,257,714

DEVICE FOR COUPLING A PAIR OF RODS

Andrew Hankosky; Robert L. Clapper, and Earl A. Bake, all of Pittsburgh, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 6, 1978, Ser. No. 884,091
Int. Cl.[2] F16D *3/80*; F16L *17/00*
U.S. Cl. 403—31 **5 Claims**



1. A device for operably coupling a first rod to a second rod having a common axis and being capable of movement along said axis for transmitting tensile and compression forces therebetween, said device comprising:

an extension of said first rod having an intermediate portion with an exterior surface which is parallel with said axis and an end portion extending radially from said exterior surface to define a piston member;

a cylinder member mounted at an end of said second rod and including a cylindrical wall that extends by said piston member for sliding, sealed contact therebetween, said cylinder member having an end thereof remote from said second rod which includes an opening therethrough;

said intermediate portion of said extension being received within said opening for sliding, sealed contact between said exterior surface and an interior surface of said opening;

said extension of said first rod and said cylinder member having mating surfaces thereon transverse to said axis capable of engagement therebetween to establish a maximum axial distance between said first rod and said second rod and for transmitting tensile force on one of said rods directly to the other of said rods;

a chamber within said cylinder member defined by said cylindrical wall, said end of said cylinder, said exterior surface and a first side of said piston member;

said piston member having a second side capable of engaging a contacting surface relative to said end of said second rod for transmitting compression force on one of said rods directly to the other of said rods and to establish a minimum axial distance between said first rod and said second rod; and

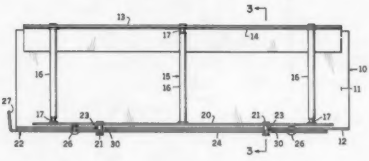
means for filling said chamber with pressurized compressible fluid for biasing said first rod toward said second rod and for limiting tensile force being transmitted from said first rod to said second rod when a relative distance therebetween is less than said maximum axial distance and greater than said minimum axial distance.

4,257,715

BINDER ASSEMBLY

Robert I. Ferrero, Imperial, Mo., assignor to Loose Leaf Metals Co., Inc., St. Louis, Mo.

Filed Jan. 10, 1977, Ser. No. 758,192
Int. Cl.[3] B42F *3/02, 13/30*
U.S. Cl. 402—47 **2 Claims**



1. A binder assembly, comprising:

(a) base means providing opposed side flanges, one of the flanges being fixed and the other flange being hinged,

(b) material-holding means connected to the hinged flange, and movable to an open position away from the fixed flange and to a closed position adjacent the fixed flange, the material-holding means including a lock lug, and

(c) latching means interconnecting the fixed flange and material-holding means in the closed position, including:

(1) an edge-open slot in the fixed flange for receiving the lock lug, and

(2) a locking element slidably mounted for linear movement adjacent the fixed flange, the locking element having an edge-open slot aligned with the edge-open slot of the fixed flange in an unlocked position of the locking element, the slot of the locking element being at least partially defined by a cam surface inclined angularly to the direction of movement of the locking element and movable across the edge-open slot of the fixed flange as the locking element is moved linearly, the same cam surface engaging the lock lug as the lock lug is moved into the slot of the fixed flange to move the locking element linearly in one direction to a locked position in which the edge-open slots are misaligned, and also engaging the lock lug to eject the lock lug from the edge-open slots as the locking element is moved linearly in the opposite direction to the unlocked position in which the edge-open slots are aligned.

4,257,716

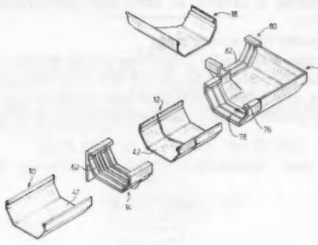
ROLL-FORMED METAL EAVESTROUGHING WITH PLASTIC FITTINGS

David G. Woodrow, Dundas, Canada, assignor to GSW Limited/GSW Limitee, Toronto, Canada

Filed Feb. 5, 1979, Ser. No. 9,751
Int. Cl.[3] E02B *5/00*
U.S. Cl. 405—118 **7 Claims**

1. In combination a roll-formed sheet metal eavestrough and a plastic injection molded support fitting therefor, said eaves-

trough having compactly overturned longitudinally extending edge portions of a thickness substantially greater than the thickness of the metal, said fitting being formed of semi-rigid plastic and having two spaced-apart clip portions to receive



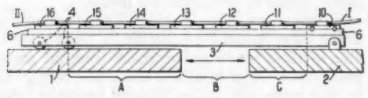
said through edge portions as they are snap-fitted into said clips, said fitting having a body portion with an internal surface approximating the external shape of said trough to encompass same with said trough clipped in and supported by said fitting.

4,257,717

METHOD AND APPAPATUS FOR INSTALLING A POWER CABLE OR A SIMILAR ELONGATED MEMBER BETWEEN TWO BODIES

Sigmund Ege, Oslo, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 3, 1977, Ser. No. 839,069
Int. Cl.[2] F16L *3/00*
U.S. Cl. 405—154 **3 Claims**



1. Apparatus for installing an elongated member over two bodies with a changeable gap between the bodies, comprising a flexible structure connected to the bodies and movably engaged with at least one of the bodies, a plurality of fastening means movably mounted on the structure for securing the elongated member at a plurality of points along the structure, and adjusting means for evenly distributing the plurality of fastening means and bending the elongated member between adjacent fastening means in response to changes in the gap, wherein at least one of the fastening means is moved hydraulically, and including means arranged in the variable gap for controlling fastening means movement.

4,257,718

SEMI-SUBMERSIBLE PIPELAYING CRAFT EQUIPPED FOR LAYING PIPES ON SEA BEDS, INCLUDING DEEP BEDS, AND THE METHOD OF OPERATION

Giovanni Rosa, and Pasquale Brando, both of San Donato Milanese, Italy, assignors to Saipem, S.p.A., Milan, Italy

Filed Jul. 6, 1978, Ser. No. 922,201
Claims priority, application Italy, Dec. 27, 1977, 31275 A/77
Int. Cl.[3] B63B *35/04*
U.S. Cl. 405—167 **18 Claims**

1. A semi-submersible pipelaying craft equipped with the following means for launching and laying pipes, including at great depth and under hostile environment conditions, comprising:

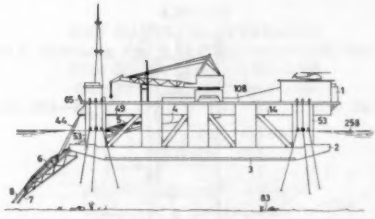
(a) an articulated or composite launching ramp including an inner fixed inclined ramp, an intermediate internal inclinable ramp hinged to the fixed ramp, and an outer inclinable external ramp hinged to the internal ramp;

(b) means operatively connected to the craft and the internal ramp for connecting the internal ramp to the craft and for moving and locking the internal ramp for navigation of the craft and launching and laying pipe, and in hostile environmental conditions;

(c) means operatively connected to the craft and the external ramp for connecting the external ramp to the craft and for moving and locking the external ramp for navigation of the craft and launching and laying pipe, and in hostile environmental conditions;

(d) a horizontal swivel assembly on the craft and adjacent the fixed inclined ramp for aligning, with the pipe being laid, the pipe portions to be welded thereto, and for bringing said pipe portions up to the pipe being laid;

(e) an assembly of rocker cradles and tensioning devices on the fixed ramp for supporting and conveying pipe to be laid from the swivel assembly to the internal ramp;



(f) an assembly of rocker cradles on the internal ramp for supporting and conveying pipe to be laid from the fixed ramp to the external ramp;

(g) an assembly of rocker cradles on the external ramp for supporting and conveying pipe to be laid from the internal ramp to the sea side of the external ramp;

(h) a system on the craft for unloading the pipes from the supply craft and for storing them and bringing them up to the swivel assembly;

(i) an electronic control system on the craft which processes the data received from the various sensors and compares it with the programmed data for the laying operations, in order to impose on the pipelaying craft an optimum automatic dynamic positioning so that even under hostile environmental conditions, the pipe lays on the sea bed along the required trajectory, even at great depth; and

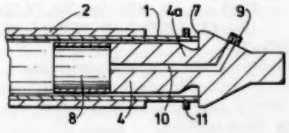
(j) means operatively connected to the craft for controlling the peak loads on the pipe laying system which can occur during the pipe laying operation.

4,257,719

UNDERWATER PIPELINES

Kevin W. Hunt, and Peter J. Taylor, both of Barrow-in-Furness, England, assignors to Vickers Limited, England

Filed Apr. 17, 1978, Ser. No. 897,126
Int. Cl.[3] F16L *1/04*
U.S. Cl. 405—173 **4 Claims**



1. A method of recovering an underwater pipe which method comprises inserting at least part of a recovery line

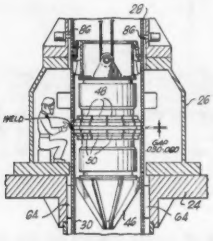
attachment into an open end of the pipe, such that at least part of the attachment is radially disposed relative to the pipe wall adjacent said open end, locating an explosive charge at least closely adjacent a face of the pipe wall so as to lie generally radially opposite a portion of said attachment disposed adjacent the other face of said pipe wall, explosively deforming the pipe toward a portion of the attachment by detonating the explosive charge so that the pipe is mechanically secured and tightly sealed to the attachment, and bringing the pipe to the surface by hauling on a lifting line secured to the attachment.

4,257,720

APPARATUS AND METHOD FOR DRIVING MEMBERS INTO THE OCEAN FLOOR

John T. Ostgaard, Los Angeles, Calif., assignor to Pipe Technology Systems, Inc., El Segundo, Calif.

Filed Jan. 15, 1979, Ser. No. 3,593
Int. Cl.³ E02D 5/28
U.S. Cl. 405—227 **29 Claims**



1. A method for driving a member into the ocean floor comprising the steps of:
positioning a tower on the ocean floor at a location where said member is to be driven;
positioning at least a first section of said member at said location contiguously with said tower;
positioning a second section of said member above said first section;
securing said second section to said first section;
positioning a jacking cylinder with a piston reciprocable therein above said second section and connecting said cylinder to said tower to prevent upward movement thereof;
jacking said first and second sections downwardly by causing said piston to move downwardly within said cylinder, pushing said sections before it;
retracting said piston within said cylinder and lowering said cylinder; and
again causing said piston to move downwardly within said cylinder, thereby further jacking said first and second sections downwardly.

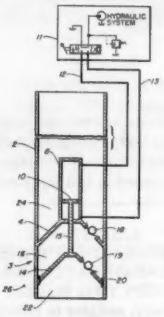
4,257,721

SYSTEM FOR PLACEMENT OF PILES INTO THE SEAFLOOR

Harvey H. Haynes, 690 Mesa Dr., Camarillo, Calif. 93010

Filed Apr. 30, 1979, Ser. No. 34,221
Int. Cl.³ E02D 7/18; B63B 21/26
U.S. Cl. 405—227 **30 Claims**

1. A self-driving pile assembly, comprising:
a. a hollow tubular pile casing open at each end thereof; one end thereof being the leading-end of the pile which is driven into a seafloor;
b. a watertight, pressure-resistant bulkhead spanning the interior walls of said pile casing at a position between the open ends thereof and separating the interior of said housing casing into upper and lower chambers;
c. a pressure-differential pump unit mounted centrally to said bulkhead for driving said pile casing into the seafloor;
d. said pump unit including means for pumping water and sediment from said lower chamber through the pump unit into and through said upper chamber whereby a pressure differential is created to force said pile casing into the seafloor;
e. said pump unit comprising:
an hydraulic cylinder containing piston means; said piston means operable to be moved in a reciprocating manner;
means connected to said hydraulic cylinder for operating said piston means in said reciprocating manner;



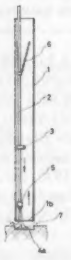
a diaphram means movably mounted beneath said hydraulic cylinder;
a ram-rod means slidably passing through one end of said hydraulic cylinder and connecting said piston means to said diaphram means to impart movement from said piston means to said diaphram means;
at least one check valve in said bulkhead and at least one check valve in said diaphram means, respectively, operable to allow water and sediment from the seafloor to pass therethrough from said lower pile casing chamber to said upper pile casing housing chamber when said pile assembly is to be moved downward into the seafloor.

4,257,722

PILE DRIVING METHOD

Hisaharu Nakajima, Onomichi, Japan, assignor to Toa Harbor Works Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1979, Ser. No. 27,779
Claims priority, application Japan, Apr. 6, 1978, 53/41595
Int. Cl.³ E02D 7/24
U.S. Cl. 405—248 **12 Claims**



1. A pile driving method capable of driving a pile into ground having a hardness N value of greater than 50, comprising mounting a water guide pipe along a pile to be driven, said water guide pipe being vertically movable relative to said pile

and slidably retained next to said pile, and while crushing the rock of the piling bed by hitting at the top of the pile and removing the crushed rocks by a high pressure water sent through said water guide pipe, driving the pile into the rock bed by a vibration pile driver.

4,257,723

DEVICE FOR SUCKING UP SOLID MATERIALS OR OBJECTS

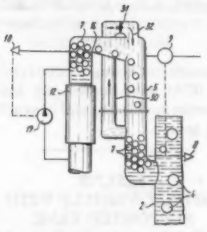
Kiem T. Kwee, Amstelveen, Netherlands, assignor to IHC Holland N.V., Rotterdam, Netherlands

Filed Aug. 21, 1979, Ser. No. 69,102

Claims priority, application Netherlands, Aug. 23, 1978, 7808700

Int. Cl.³ E02F *3/88*

U.S. Cl. 406—49 **1 Claim**



1. A device for sucking up solid materials or objects with a density higher than water, said device comprising a suction tube running from the surface to be treated, such as the sea bed, to a position above the water level, said suction tube between its ends being connected to a closed tube the upper end of which is closed by means of a feeding device for light bodies keeping their shape, said tube being connected to a compressor by means of which the water can mainly be pressed out of the feeding tube with the exception of a water trap at the position of the connection with the suction tube, characterized in that said feeding tube is provided with a return line whose lower end is connected to the feeding tube at a point adjacent but above the water level of the water-trap, which return line is connected at its upper end to the upper end of the feeding tube, said feeding tube and return line forming a closed circuit provided with a blower which can generate a downwardly directed stream of air in the feeding tube.

4,257,724

MILLING TOOL FOR MACHINING CYLINDRICAL SECTIONS

Gottfried Blaimschein, and Otto Marzy, both of Steyr, Austria, assignors to GFM Gesellschaft fuer Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Filed Apr. 6, 1979, Ser. No. 27,857

Claims priority, application Austria, Apr. 18, 1978, 2713/78

Int. Cl.³ B23C *3/06, 5/26*

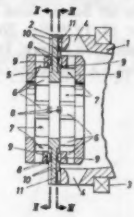
U.S. Cl. 409—232 **3 Claims**

1. A milling tool for machining cylindrical sections of a workpiece, comprising

(a) a rotatable tool drum adapted to be mounted so that it surrounds the workpiece to be machined and to be driven, the drum having a shell formed near one end with apertures for removal of chips,

(b) an internally cutting, annular primary cutter head peripherally secured to the shell at the one end, the primary cutter head having a first, inwardly directed end face and a second, outwardly directed end face, and

(c) an internally cutting, annular supplemental cutter head including axially projecting claws detachably secured to one of the end faces of the primary cutter head, the claws



supporting the supplemental cutter head on the primary cutter head against axial movement in relation thereto.

4,257,725

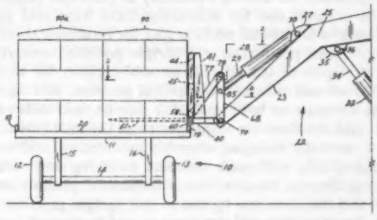
HAY HANDLING APPARATUS

Edwin C. Zieschang, Rte. 1, Box 48, Chappell Hill, Tex. 77426

Filed Jan. 22, 1979, Ser. No. 5,593

Int. Cl.³ A01D *87/12*; B66F *7/06*

U.S. Cl. 414—84 **14 Claims**



1. Hay handling apparatus, comprising support means having plural horizontally spaced parallel horizontal spike means depending therefrom and having pivotal connection means and having stop means supported thereby for supporting bales of hay fully engaged by said spike means, said spike means being adapted to piercingly engage bales of hay to support said bales of hay, said pivotal connection means being adapted to releasably pivotally engage pivotally upwardly and downwardly movable arm means of a vehicle loader supporting the apparatus whereby the apparatus may be raised and lowered and may be transported between different locations by said vehicle, pusher means slidably connected to said spike means transversely above said spike means, first pivotal means pivotally connected at one end to said support means, second pivotal means depending from said pusher means and being pivotally connected to the other end of said pivotal means above said support means, said first pivotal means being releasably connected spaced from its said pivotal connection to said support means to generally horizontally reciprocably movable means of said vehicle loader whereby said first pivotal means may be pivotally moved toward and away from said vehicle loader to move said pusher means between a retracted position adjacent said stop means and an extended position along said spike means spaced from said stop means to disengage said bales of hay from said spike means onto a ground or floor surface or onto a stack of bales in level dispositions, said first and second pivotal means being movable by said generally horizontally reciprocably movable means to pivotally rotate said support means and said spike means to maintain said spike means in approximately horizontan dispositions during upward and downward movements of said support means by said movable arm means.

4,257,726

APPARATUS FOR STORING AND EMPLACING FLOOR PLATES, PARTICULARLY FOR AMUSEMENT RIDES

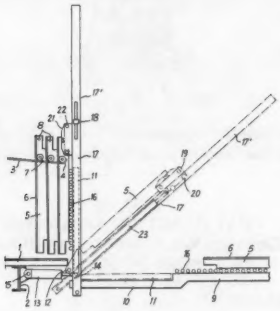
Michel Reverchon, and Christian Reverchon, both of Route de Courbuisson, Samois sur Seine (Seine et Marne), France

Filed Dec. 13, 1978, Ser. No. 968,968

Claims priority, application France, Dec. 13, 1977, 77 37525

Int. Cl.³ B65G *57/28*

U.S. Cl. 414—104 **7 Claims**



1. Apparatus for storing a plurality of plate-like members in upright position and for delivering them from said upright position to a horizontal position and for returning them from said horizontal position to said upright position, comprising a support, a pair of spaced rails on said support for storing a plurality of said members in upright position, said members having elements at both ends that ride on said rails and by which said members are suspended from the rails between the rails, a vertically swinging assembly mounted on said support and engageable with said members to swing said members downwardly one by one into a horizontal position and to return said members one by one to said upright position, track means for receiving said members in said horizontal position, and pusher means mounted on said assembly for lifting each said member off said rails in an upright position of said assembly and for pushing said members along said track means in a horizontal position of said assembly.

4,257,727

FULL DEPTH UNCASER

John J. Peyton, Santa Barbara, Calif., assignor to Industrial Automation Corp., Goleta, Calif.

Continuation-in-part of Ser. No. 772,425, Feb. 28, 1977, abandoned, which is a continuation of Ser. No. 572,440, Apr. 28, 1975, abandoned, which is a division of Ser. No. 408,922, Oct. 23, 1973, Pat. No. 3,938,847, which is a continuation-in-part of Ser. No. 305,709, Nov. 13, 1972, abandoned. This application Sep. 25, 1978, Ser. No. 945,393

Int. Cl.³ B65B *21/02*

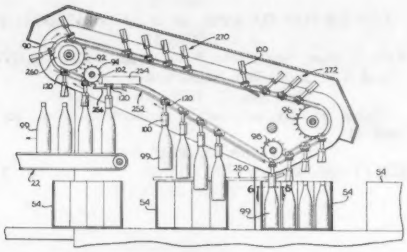
U.S. Cl. 414—416 **23 Claims**

1. An uncasing machine comprising:

a plurality of gripping means each having actuating members, each of said gripping means being a means for automatically gripping the neck of a bottle adjacent the top thereof upon the upward encouragement of said actuating member from a lower first position by contact with the top of a bottle, and for releasing the bottle by the forcing of said actuating member from a second upper position to said first position;

support means for supporting said gripping means, said support means being means for yieldably supporting each of said gripping means in predetermined dispositions in parts of the path of travel of a transport means,

a transport means coupled to said support means, said transport means being a means defining a continuous said path of travel of each of said gripping means, said path of travel including a first leg having a substantial downwardly angle so that said gripping means may proceed downward to engage bottles at a first transport position, substantially immediately followed by a second leg having an upward angle substantially equal in magnitude to said downward angle and



synchronizing means, including a conveyor means, for conveying cases filled with bottles past said first transport position at a uniform velocity and in synchronization with said transport means.

4,257,728

GARBAGE DISPOSAL VEHICLE WITH BOX BEAM SUPPORTED TANK

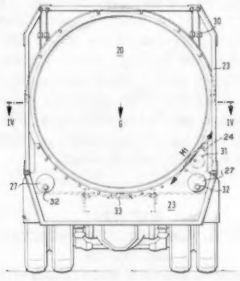
Herbert Schmidt, Friedberg; Erwin Kurz, Augsburg; Rudolf Berger, Friedberg, and Erich Pilz, Gersthofen, all of Fed. Rep. of Germany, assignors to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 2, 1979, Ser. No. 17,028

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1978, 2809191

Int. Cl.³ B60P *1/40*

U.S. Cl. 414—468 **5 Claims**



1. In a garbage disposal vehicle having a chassis, a storage tank rotatably mounted on the chassis with a rear opening end, a cover for covering the rear opening end including a helical guide baffle which is effective in moving and compacting garbage into the tank during rotation of the tank, a large-size ball bearing having an inner race engaged around the tank in the vicinity of the rear open end and an outer race for supporting the tank for rotation, and a rim gear connected around the tank in the vicinity of the rear open end thereof with drive means engaging the rim gear to rotate the tank, the improvement comprising an auxiliary frame plate connected to the chassis, a box beam having side top and bottom portions extending around the tank supported on said auxiliary frame, a substantially horizontal pin connected between said box beam and auxiliary frame for permitting horizontal movement between said auxiliary frame and box beam, the outer race of the

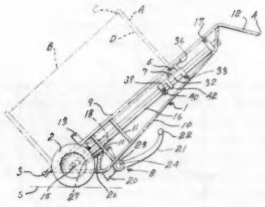
large-size ball bearing being connected to respective opposite side portions of said box beam, said box beam extending around the outer race, at least one hinge connected to said top portion of said box beam and to the cover for pivotally mounting the cover to close the rear opening end of the tank, at least one power cylinder connected between said top portion of said box beam and the cover for moving the cover, a locking mechanism connected to said box beam and engageable with the cover for locking the cover in its covering position over the rear open end of the tank, and a longitudinally extending extension of said box beam connected to the drive means whereby forces applied to said box beam are not transferred to the chassis.

4,257,729

HAND TRUCK

Gilles Morissette, 7950 Avenue Jacques-Rousseau, Apt. 403, Riviere-des-Prairies, Quebec, Canada H1E 1J6

Filed May 30, 1979, Ser. No. 43,656
Claims priority, application Canada, May 6, 1977, 277877
Int. Cl.³ B62B *1/06*
U.S. Cl. 414—490 **2 Claims**



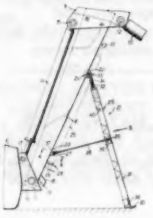
1. A hand truck including an elongated support, a pair of wheels carried by the lower end portion of said support, a pair of feet secured to the lower end of said support forwardly and downwardly from said wheels and adapted to maintain said wheels off a supporting surface when said feet rest on said surface, said feet clearing said surface when said support is rearwardly tilted in inclined position with said wheels in rolling engagement with said surface, a handle carried by the upper end of said support, a bracket mounted on said support intermediate its ends and a clamp mounted on said bracket at the front of said support and clampable about the top bead or top flange of a load, said clamp carried by said bracket at a level to be engageable with the top bead, or flange, of a load upstanding on a supporting surface and the support upright on its feet adjacent the container, whereby once the load is clamped by said clamp, said support can be tilted backwardly by said handle along with said load suspended from said clamp, so that said support can take said inclined position to move the hand truck and load about by means of said handle, a jack mechanism carried by said support and connected to said bracket, and operable to raise said bracket along said support, whereby a load clamped by said clamp can be raised off the ground and along said support by operation of said jack mechanism a distance sufficient to locate the center of gravity of the load suspended from said clamp, such that its line of force will fall between said feet and said wheels, when both said feet and said wheels contact a supporting surface, said jack mechanism including a foot-operated pedal pivotally carried by the lower end portion of said support and at the back of said support, a cam member fixed to said pedal, an elongated member carried by said support for longitudinal movement therealong, said bracket mounted on said elongated member, and a flexible tension member attached to the lower end of said elongated member at one end, and to said cam member at the other end, whereby downward movement of said pedal causes raising of said elongated member along said support.

4,257,730

STAND DEVICE FOR BOOM-TYPE WORKING IMPLEMENTS

Hiroaki Kawakita, Sakai, Japan, assignor to Dukane Corporation, St. Charles, Ill.

Filed Apr. 30, 1979, Ser. No. 34,619
Claims priority, application Japan, May 4, 1978, 53/60337[U]
Int. Cl.³ B65D *90/14*
U.S. Cl. 414—686 **11 Claims**



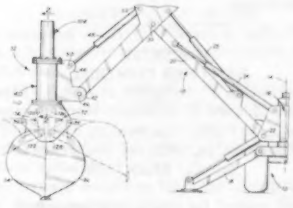
1. A stand device for a boom-type working implement having a boom provided with a working member and a connector and detachably connectable to a tractor by the connector, the stand device comprising a stand member having one end pivoted to the boom close to the working member and the other end provided with a ground engaging portion, and a connecting member having one end pivoted to the stand member and the other end pivoted to the boom, the stand member being holdable by the connecting member at an angle with the boom with the ground engaging portion positioned to the rear of the working member as spaced apart from the working member, the stand device including disengagable means for holding the stand member in a position along the length of the boom, the connecting member being holdable along the lengths of the boom and the stand member when the stand member is held along the boom.

4,257,731

POWERED IMPLEMENT WITH WORK ELEMENTS PIVOTALLY MOUNTED ON AN IMPLEMENT MOUNTING AND A TORQUE TUBE FOR ROTATING SUCH MOUNTING

Robert Beaver, Coos Bay, Oreg., assignor to North Bend Fabrication & Machine, Inc., North Bend, Oreg.

Filed Sep. 14, 1978, Ser. No. 942,398
Int. Cl.³ B66C *3/00*
U.S. Cl. 414—694 **6 Claims**



1. Power-operated implement mechanism comprising: a casing structure including a base,

an implement mounting adjacent the base of said casing structure,

thrust bearing means between the base of said casing structure and said implement mounting,

a torque tube rotatably mounted in said casing structure joined to said mounting,

a fluid-operated ram including a cylinder mounted on said casing structure, said ram further including a piston rod extending through said torque tube,

first and second bearing means rotatably supporting said rod in said torque tube, positioned adjacent upper and lower ends, respectively, of said torque tube,

a work implement pivotally mounted on said mounting,

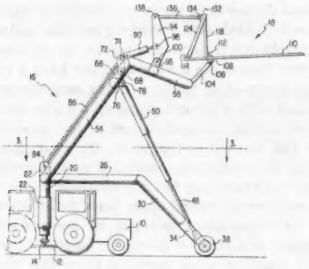
a linkage system interconnecting the bottom end of said rod and said work implement, and

means for rotating said torque tube including motor means mounted on said casing structure.

4,257,732
HAY STACKER

Leroy Staffanson, Rte. 1, Box 192, Sidney, Mont. 59270

Filed Jul. 20, 1979, Ser. No. 59,150
Int. Cl.³ A01D *87/12*; B66F *9/00*
U.S. Cl. 414—703 **25 Claims**



1. Apparatus adapted to be connected to the draw bar of a tractor, which comprises:

an agricultural implement normally positioned to engage the ground; and

a frame for supporting said implement and for connecting same to the draw bar of said tractor;

wherein said frame includes:

a post extending vertically from said draw bar to a position above the top of said tractor;

a support frame extending forwardly from said post above said tractor and terminating in a ground-engaging wheel assembly positioned in front of said tractor; and

means pivotally coupled between said post and said wheel assembly for lifting said implement from its ground-engaging position to a raised position well above the top of said tractor.

4,257,733
DIFFUSER CONTROL

Phiroze Bandukwalla, N. Syracuse; Gordon L. Mount, West Monroe, and Howard W. Kirtland, North Syracuse, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,404
Int. Cl.³ F04D *27/00*
U.S. Cl. 415—13 **7 Claims**

1. A diffuser control for controlling vapor flow through a diffuser passage comprising:

an annular recess defined by a housing of the diffuser passage and in communication therewith;

diffuser restriction means supported for movement within the recess and the diffuser passage between a throttling position, wherein the restriction means allows a restricted vapor flow through the diffuser passage, and an open position for permitting a substantially free flow of vapor through the diffuser passage, and including

a front, radially and annularly extending surface,

an outside axial surface extending rearward from an outside radial edge of the front surface and spaced from the housing to facilitate movement of the diffuser restriction means, and

an inside axial surface extending rearward from an inside radial edge of the front surface and spaced from the housing to facilitate movement of the diffuser restriction means;

resilient means supported by the housing and urging the restriction means toward the throttling position;

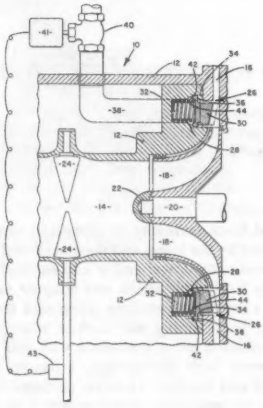
first stop means for limiting movement of the restriction means at the throttling position;

a low pressure conduit for connecting the annular recess to a low pressure source;

sealing means including

an outside annular flange located within the annular recess and radially extending outward from the outside axial surface of the diffuser restriction means,

an inside annular flange located within the annular recess



and radially extending inward from the inside axial surface of the diffuser restriction means,

a first annularly extending sealing surface defined by the housing rearward of the outside annular flange, and

a second annularly extending sealing surface defined by the housing rearward of the inside annular flange, and wherein

when the diffuser restriction means is in the open position, the outside and inside annular flanges abut against the first and second sealing surfaces respectively to limit rearward movement of the diffuser restriction means and to retard vapor flow from the diffuser passage rearward past the diffuser restriction means; and

valve means for regulating vapor flow through the low pressure conduit and including a first position for maintaining a low pressure in the annular recess and a pressure difference across the diffuser restriction means for maintaining the restriction means in the open position, and a second position for maintaining a high pressure in the annular recess wherein the urging means maintains the restriction means in the throttling position.

4,257,734

GUIDE VANES FOR GAS TURBINE ENGINES

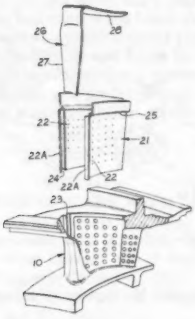
Kenneth R. Guy; Terence W. Broom, both of Bristol, and Peter J. Maggs, Midsomer Norton, nr. Bath, all of England, assignors to Rolls-Royce Limited, London, England

Filed Mar. 5, 1979, Ser. No. 17,556

Claims priority, application United Kingdom, Mar. 22, 1978, 11529/78

Int. Cl.³ F01D 5/18, 5/14

U.S. Cl. 415—115 8 Claims



1. A vane for a gas turbine engine, the vane comprising: a hollow body externally of aerofoil form, the inner surface of which is provided with confronting grooves extending in a direction along the length of the aerofoil form at a location intermediate the leading and trailing edges of the aerofoil form; a first insert comprising two perforated panels situated inside a trailing region of the aerofoil form and defining therewith one or more air passages between the insert and the wall of the body, the first insert having portions which engage in the grooves in the wall of the body, and the first insert being provided with confronting grooves extending in a direction along the length of the aerofoil form at a location intermediate the leading and trailing edges of the aerofoil form; and a second insert comprising a first panel extending across the void in the body, the second insert having edges which engage in the confronting grooves in the first insert and having a second panel closing at least part of an end of the void in the body.

4,257,735

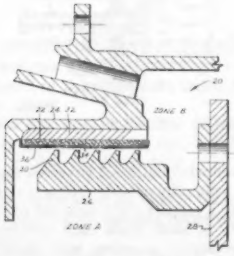
GAS TURBINE ENGINE SEAL AND METHOD FOR MAKING SAME

John S. Bradley, Boxford, and Alan W. Dix, Danvers, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Dec. 15, 1978, Ser. No. 969,915

Int. Cl.³ F01D 11/08

U.S. Cl. 415—174 12 Claims



1. A composite article for use in a seal in a gas turbine engine, said seal including a face seal adapted to cooperate with a rotating edge to prevent the passage of fluid from a first zone to a second zone in said engine, said composite article comprising:

a substrate of sintered metallic fibers and having an apparent density within the range of 14.0% to 22.5%, said substrate including a network of interconnected pores and metallic bonds at points of contact between said fibers, said substrate further including an external face having surface pores in communication with said network; and

a thin film barrier surface layer impervious to the passage of fluid, said layer disposed on said external face and filling said surface pores.

4,257,736

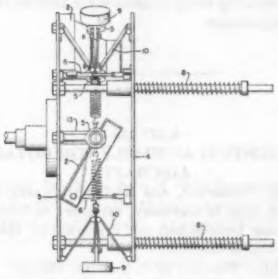
GOVERNED PROPELLER TYPE WIND MOTOR ARRANGEMENT

Dennis Jacobs, Rte. 1, Box 171D, Audubon, Minn. 56511

Filed Mar. 14, 1979, Ser. No. 20,344

Int. Cl.³ F03D 7/04

U.S. Cl. 416—51 11 Claims



1. A propeller type wind motor arrangement comprising:

(a) a blade mounting hub;

(b) a plurality of air foil blades;

(c) blade receiving means for mounting said blades to said hub for pivotal movement about a longitudinal axis of said blades; and

(d) governor means for retaining said blades at a first high torque, relatively low tip speed ratio forming angle during motor start-up and at rotational speeds below a minimum normal operational speed, and for abruptly shifting said blades to a second high efficiency, relatively high tip speed ratio forming angle when said operational speed is reached.

4,257,737

COOLED ROTOR BLADE

Dale E. Andress, and Douglas H. Clevenger, both of Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 10, 1978, Ser. No. 923,421

Int. Cl.³ F01D 5/18

U.S. Cl. 416—97 R 1 Claim

1. A cooled rotor blade having an airfoil shaped section and a root section including,

a cooling passage extending from the root section into the airfoil shaped section,

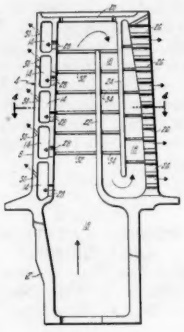
a plurality of compartments being located lengthwise in line in a radial direction behind only the leading edge of the blade,

each compartment having cooling openings extending through the leading edge to the exterior of the airfoil shaped section of the blade to achieve a desired pattern of cooling,

adjacent lengthwise compartments having a common wall,

a sized opening connecting the cooling passage to each of

the compartments to control the pressure in each compartment,



each sized opening being located at the bottom of its lengthwise compartment.

4,257,738

ROTOR MOUNTING ASSEMBLY FOR ROTARY WING AIRCRAFT

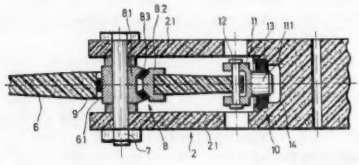
Alois Schwarz, Putzbrunn, and Karlheinz Mautz, Ottobrunn, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,653

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712706; May 17, 1977, 2722250

Int. Cl.³ B64C *11/06*

U.S. Cl. 416—134 A **15 Claims**



1. A central headpiece for a rotor head mounting assembly of rotor wing aircraft having a drive shaft and a rotor including rotor blades for mounting said rotor for rotation on said drive shaft comprising an integral body of composite fiber material adapted to have said rotor blades mounted thereon, said central headpiece being shaped to define a plurality of rotor blade mounting support arms each adapted to mount a rotor blade, each of said mounting support arms having a bifurcated configuration composed of a pair of sides which are of a generally flat planar configuration and each of which extends in a plane perpendicular to the drive shaft of an aircraft upon which said headpiece is adapted to be mounted, said integral body of said headpiece being essentially composed of a pair of generally congruent planar plate members lying in essentially parallel planes with intermediate spacer means located therebetween, said plate members and said spacer means being integrally joined together to form said central headpiece as a unitary body of composte fiber material, said mounting support arms being adapted to receive therebetween connection means for pivotally supporting each of said rotor blades between each of said pair of sides of said mounting support arms.

4,257,739

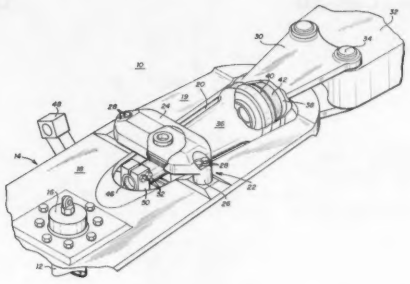
SOFT INPLANE HELICOPTER ROTOR

Cecil E. Covington, Hurst; David E. Snyder, Arlington; Walter G. Sonneborn, and Wesley L. Cresap, both of Fort Worth, all of Tex., assignors to Textron, Inc., Providence, R.I.

Filed Sep. 11, 1978, Ser. No. 941,255

Int. Cl.³ B64C *27/38*

U.S. Cl. 416—134 A **14 Claims**



1. In a helicopter blade-yoke coupling, the combination comprising:

a blade grip secured to said blade and extending inboard of the end of said yoke,

an elastomeric retention bearing mounted between said blade grip and said yoke to transfer centrifugal forces from said blade to said yoke while accommodating blade pitch changes and blade lead-lag in a plane about said elastomeric bearing,

a soft inplane, rigid out-of-plane coupling inboard of said elastomeric bearing between one end of said blade grip and said yoke to permit blade lead-lag motion and pitch change while damping movement of said blade grip relative to said yoke, and

a beam-wise flexible plate inboard of said soft inplane coupling and forming part of said yoke to accommodate blade flapping independently of said soft inplane coupling.

4,257,740

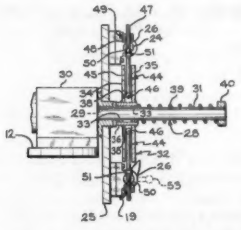
SPEED GOVERNING HUB FOR WINDMILL

Wayne G. Duez, 6130 Wildacres Rd., Curtice, Ohio 43412

Filed Jan. 15, 1979, Ser. No. 3,648

Int. Cl.³ F03D *7/04*

U.S. Cl. 416—137 **4 Claims**



1. An improved windmill speed governor for controlling the speed at which a plurality of wind driven blades rotates a drive shaft comprising a support plate mounted to rotate said drive shaft, a plurality of blade shafts each attached to a separate blade, means rotatably mounting said blade shafts on said support plate with said blade shafts spaced about said drive shaft and each extending generally perpendicular to a radius from said drive shaft, a separate control rod having an end attached to each blade shaft to extend coplanar with the axis of

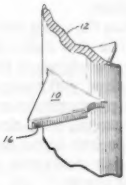
said drive shaft, each of said control rods having a second end extending toward said shaft and terminating at a head, a governor hub positioned to slide axially on said drive shaft towards and away from said support plate, said hub including first and second spaced apart plates, spring means biasing said governor hub towards said support plate, said control rod heads being positioned in the region between said spaced apart plates, such region extending parallel with said support plate, means for maintaining said control rod heads in position in the region between said spaced apart plates, release means in one of said spaced apart plates for passing said control rods as said governor hub slides axially on said drive shaft, said spring means simultaneously biasing said control rod heads to a first position wherein said blades assume a predetermined pitch, said governor hub simultaneously moving said heads to simultaneously rotate said blade shafts in response to a predetermined force upon said blades to modify said predetermined pitch whereby the maximum speed at which said blades rotate said drive shaft is controlled.

4,257,741

TURBINE ENGINE BLADE WITH AIRFOIL PROJECTION

Robert K. Betts, Cincinnati; John J. Grisik, Middletown, and John W. Zelahy, West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 2, 1978, Ser. No. 957,279
Int. Cl.³ F01D 5/22
U.S. Cl. 416—190 **2 Claims**



1. A turbomachinery blade including an airfoil and a projection from the airfoil, the projection having a contact surface which abuts a surface of an adjacent member, the contact surface including surface means to avoid adhesive wear, the improvement wherein:

the contact surface has secured thereto, as the surface means, a discrete wear pad of an improved combination of adhesive wear resistance and impact toughness, the pad:

a. comprising a substantially fully dense, compacted, sintered member of, by weight, greater than 91% up to about 95% WC, with the balance Co;

b. being of a thickness of at least about 0.01"; and

c. having thermal expansion characteristics compatible with the projection over an intended operating temperature range.

4,257,742

DEVICE FOR INTERCONNECTING TURBINE BLADES

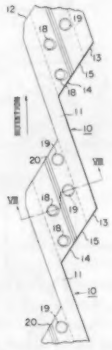
Hisao Ogata, Yokohama, and Michinobu Fujii, Hiratsuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Apr. 2, 1979, Ser. No. 26,164
Claims priority, application Japan, Apr. 3, 1978, 53-38914
Int. Cl.³ F01D 5/22
U.S. Cl. 416—190 **4 Claims**

1. A device for interconnecting turbine blades mounted on the periphery of a rotor and extending radially outward therefrom, comprising:

a turbine blade comprising a tip portion, a suction side, a pressure side, a leading section, and a trailing section;

a pair of projections exending from the tip portion of the turbine blade, one of said projections extending from the leading section of the suction side of said turbine blade, the other projection extending from the trailing section of the pressure side of said turbine blade, a radially inward surface on each of said projections, extending outwardly from said turbine blade such that as the radial inward surface extends outward from said turbine blade, the radial distance from the rotor to the radially inward surfaces is enlarging, at least two perforations on each projection extending substantially radially through each projection, the perforations on the suction side of the blades being elongated;



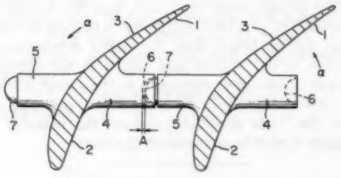
a cover piece having a pair of radially outward surfaces inclined to conform to the radially inward surfaces on said projections from the blades, a plurality of lugs, extending radially from each of said radially outward surfaces, said lugs extending substantially radially outwardly from said cover piece through said perforations in said projections, the plurality of lugs extending through the perforations extending from the pressure side of the blade being peened to form an overhang for abutting the projection.

4,257,743

COUPLING DEVICES OF MOVING BLADES OF STEAM TURBINES

Michinobu Fujii, Hiratsuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Mar. 12, 1979, Ser. No. 19,590
Claims priority, application Japan, Mar. 24, 1978, 53/33837
Int. Cl.³ F01D 5/22
U.S. Cl. 416—196 R **1 Claim**



1. A coupling device which couples adjacent turbine blades, said blades extending radially from a turbine wheel, said coupling device comprising opposing inner and outer blade surfaces;

a pair of projections integrally on opposing inner and outer blade surfaces, said projections extending from the blade surfaces circumferentially about the turbine wheel;

a hemispherical projection on one of said projections, a hemispherical recess on the opposing projection;

said hemispherical projection loosely engaging said hemispherical recess on the adjacent blade such that when said

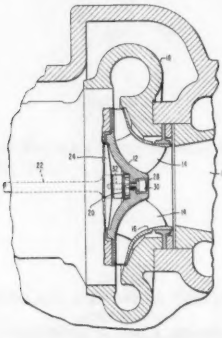
turbine wheel is at rest, there is some clearance between the hemispherical projection and the hemispherical recess of the adjacent blade.

4,257,744

IMPELLER AND SHAFT ASSEMBLY FOR HIGH SPEED GAS COMPRESSOR

Thomas E. Watson, Staunton, Va., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 21, 1979, Ser. No. 22,403
Int. Cl.³ F04D *29/22*; F16B *4/00, 7/02*
U.S. Cl. 416—244 R **6 Claims**



1. A rotatable gas compressor impeller and shaft assembly comprising:

a rotatable shaft having a threaded axial bore in its driving end;

an impeller having an axial bore therethrough and adapted to be assembled to the driving end portion of said shaft with a fastener haing a threaded shaft passing through the impeller axial bore and threaded into said shaft bore;

the rear face of said impeller having a socket surrounding the rear end of said axial bore in the impeller, the circumferential walls of said socket tapering slightly outwardly;

said driving end portion of said shaft having a basically frusto-conical shaped extremity received in wedging relation in said socket, the circumferential wall of said extremity including a plurality of forwardly-open, axially-extending grooves circumferentially spaced therearound and alternating with intervening lands;

said impeller socket being comprised of a material of lower compressive yield strength than the material forming the surface of said shaft extremity, and the circumferential dimension of said shaft extremity as defined by said lands being slightly larger than the facing circumferential dimension of the wall of said socket in the finally seated relation of said shaft extremity in the socket so that with said shaft extremity being wedged into place by said fastener the lands plastically deform the material of said impeller socket in an outward direction.

4,257,745

AUTOMATIC CONTROL SYSTEM FOR CENTRIFUGAL PUMPS

Gerry W. Thur, Alameda, and Timothy A. Moore, Pleasanton, both of Calif., assignors to Baltimore Aircoil Co., Jessup, Md.

Filed Sep. 1, 1978, Ser. No. 939,092
Int. Cl.³ F04B *49/02, 49/08*
U.S. Cl. 417—18 **2 Claims**

1. A pressure-thermal control system regulating the on-off operation of a liquid centrifugal pump in response to external flow demand which comprises in a closed loop arrangement:

a. a centrifugal pump having an inlet and outlet therein;

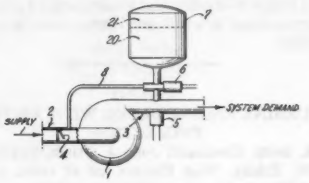
b. a check valve at the inlet side of said pump;

c. a pressure switch located at the outlet, said switch being sensitive to a preset low pressure in the pump outlet to turn on the centrifugal pump;

d. a temperature-sensitive switch located at the outlet to sense the internal liquid temperature of said pump, set to a preset temperature to turn the centrifugal pump off;

e. a pressure accumulator tank located at the outlet of said pump directly above the temperature switch;

f. a recirculation line connecting the inlet with the outlet of said pump; one end of said recirculation line located immediately adjacent to the outlet of said pump and the other end of said recirculation line located between the check valve and inlet of said pump, said recirculation line



consisting of said temperature switch and said accumulator tank, both said temperature switch and accumulator tank located immediately adjacent to the outlet of said pump with the accumulator tank located directly above said temperature switch;

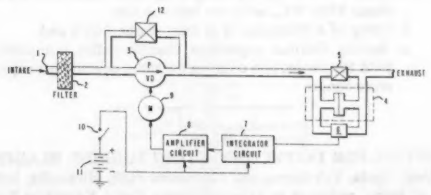
such that in operation when the temperature of the liquid in the pump and recirculation line rises and reaches the preset temperature, the temperature switch opens, causing pump shut-off and any new system demand will cause liquid stored in the accumulator tank to flow past temperature switch cooling said temperature switch and causing it to close and when system demand is sufficient to deplete liquid stored in accumulator tank and cause pressure to drop to preset pressure the pressure switch closes to start said pump.

4,257,746

DOSIMETER HAVING A LOW AIR FLOW RATE

Adoniram J. Wells, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 2, 1978, Ser. No. 948,037
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—43 **16 Claims**



1. An improved dosimeter that has an electric motor, a power source, an exhaust port, a filter means in which particles or vapors present in an air stream being pumped through the dosimeter at a controlled constant flow rate are collected on the filter means;

a variable drive pump having an inlet and an outlet, tubularly connected to the filter means and coupled to the electric motor, draws the air stream through the filter means;

an orifice being positioned in a tube attached to the pump and to an exhaust port, wherein the air stream is pumped

through the orifice and thereby creates an air pressure drop;

means for reducing pulsations in the air stream;

a differetial pressure switch positioned in a tube connected in effect parallel to the orifice is activated by a change in the air pressure drop of the air stream and creates a low voltage electrical input signal;

an integrator circuit electrically connected to a power source and to the pressure switch uses the low voltage input signal generated by the pressure switch and integrates this signal;

an amplifier circuit electrically connected to the power source and connected in series to the integrator circuit and to the electric motor which amplifies the signal generated by the integrator circuit and feeds the amplified signal to the electric motor thereby controlling the speed of the motor driving the pump in relationship to the signal generated by the pressure switch to maintain the air stream at a controlled constant flow rate; the improvement in use therewith comprises;

an adjustable by-pass valve connected in parallel with the variable drive pump whereby a fixed quantity of air from the outlet of the pump is recycled to the inlet of the pump allowing the pump to provide a constant low air flow rate of the air stream through the dosimeter.

4,257,747

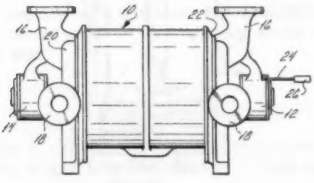
MONITORING MACHINERY BY DETECTING VIBRATIONS

Steven A. Goldman, West Nyack, N.Y., assignor to The Nash Engineering Company, Norwalk, Conn.

Filed Dec. 15, 1978, Ser. No. 970,088

Int. Cl.³ F04B *49/10, 49/00*

U.S. Cl. 417—63 **3 Claims**



1. An apparatus for monitoring a piece of machinery which, in an abnormal operating condition, exhibits a vibration frequency characteristic of that condition, said apparatus comprising a spring connected adjacent one end to said piece of machinery, a mass connected adjacent the other end of said spring so that movement of said mass relative to said piece of machinery is normally constrained solely by said spring, the combination of said mass and said spring having a natural frequency of oscillation equal to said vibration frequency so that, substantially only upon the occurrence of vibrations of said frequency, substantial oscillation of said mass occurs, means spaced from the normal position of said mass in the path of oscillation of said mass for engaging and holding said mass when said mass reaches said means for engaging and holding as a result of said substantial oscillations, and means associated with the means for engaging and holding for producing an output signal indicative of the occurrence of said abnormal operating condition of said piece of machinery when said mass reaches said means for engaging and holding.

4,257,748

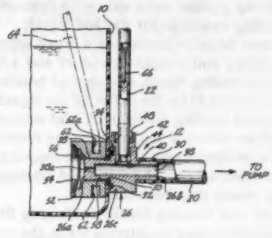
FLOW INDICATOR FOR POSITIVE DISPLACEMENT PUMP

Frank E. Ives, Kent, and Terrence G. Nash, Renton, both of Wash., assignors to Venus Products, Inc., Kent, Wash., by said Terrace G. Nash, a part interest

Filed Jan. 2, 1979, Ser. No. 573

Int. Cl.³ F04B *21/00*

U.S. Cl. 417—63 **9 Claims**



1. In a fluid supply system including a source of liquid to be pumped and a positive displacement liquid pump, an improved flow indicator for a positive displacement pump comprising:

first means defining a first passage, said first passage having an inlet and an outlet, said inlet being adapted for coupling to said source of liquid to be pumped, said outlet being adapted for connection to the inlet of said positive displacement liquid pump,

second means defining a second passage having an inlet and an outlet, said second means being at least partially transparent, said outlet being open to the atmosphere at a position above the surface of said source of liquid, said inlet being in fluid communication with said first passage at a location between the inlet and outlet of said first passage,

restriction means in said first passage for partially restricting flow through said first passage, said restriction means being located between the inlet to said first passage and the location at which said second passage is in fluid communication with said first passage, and

float means movably positioned in said second passage for movement along said passage in reaction to a variation in fluid level in said second passage.

4,257,749

LIQUID RING COMPRESSOR OR VACUUM PUMP

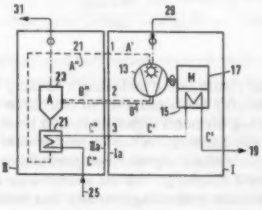
Claus Ramm, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 27, 1979, Ser. No. 69,992

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1978, 2841906

Int. Cl.³ F04C *19/00*

U.S. Cl. 417—68 **2 Claims**



1. In a liquid ring pump with a liquid cooled electric motor for driving the impeller, as well as with a liquid separator,

wherein the individual components are arranged in adjoining housing which are divided into chambers by partitions, said housings being connected to each other without piping and sealed to the outside to form a unit which has only four external connections which comprise a gas inlet and outlet and a liquid inlet and outlet, the improvement comprising:

(a) a first housing containing therein the liquid ring and the liquid cooled electric motor, said first housing having an external gas inlet connected to the suction side of the pump and an external cooling liquid outlet, said first housing having a plane outer side with first, second and third connecting openings for gas and liquid;

(b) a second housing containing a liquid separator designed as a cooling and storage container and a heat exchanger for the operating liquid, said second housing having a gas outlet connected to the outlet of the liquid separator and an external cooling liquid inlet, said second housing having a plane outerside with connecting openings for gas and liquid matching those of said first housing, said first and second housing abutting with said openings aligned and sealing means therebetween;

(c) both of said housing blocks containing first, second and third canals formed by internal walls, the respective canals being connected to each other through said connecting openings, of which the first canals connect the cooling liquid inlet through the heat exchanger for the operating liquid, the first connecting opening and the heat exchanger for the electric motor to the cooling liquid outlet, the second canals connect the inlet of the liquid separator through the second connecting opening to the pressure side of the pump and the third canals connect the outlet of the liquid separator through the heat exchanger for the operating liquid and the third connecting opening to the suction side of the pump so that the canals form a closed operating liquid circuit.

4,257,750

RADIAL PISTON PUMP

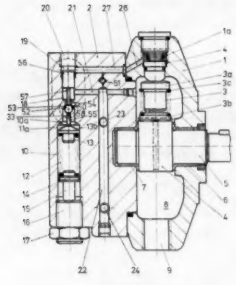
Jörg Dantlgraber; Horst Kramer, both of Lohr, and Horst Fischer, Herne, all of Fed. Rep. of Germany, assignors to G. L. Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Apr. 16, 1979, Ser. No. 30,137

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1978, 2817173

Int. Cl.³ F04B *1/18*

U.S. Cl. 417—270 **4 Claims**



1. In a radial piston pump including a housing having a load port, an intake port and a plurality of discharge valves, a plurality of pumping elements arranged in said housing and cooperating with said discharge valves, a combination comprising a first control space adjoining said load port and communicating with one of said discharge valves; a multiway control valve having a piston area projecting into said first control space and defining a second control space; a channel system connecting the remaining discharge valves to said second control space and including a collection channel leading to a tank and control channels connecting said first control space to said second control space and said second control space to said collection channel; spring means for urging said control valve into a first switching position in which said first control space is connected via said control channels and said second control space to said collection channel, the increased load pressure in said first control space acting against said piston area and urging said control valve to a second switching position in which said first control space is shut off from said collection channel; said channel system including a channel connecting said first control space to said one discharge valve and branch channels connecting the remaining discharge valves to said collection channel, and said control channel cooperating with said sliding spool to separate in one switching position of the control valve said one discharge valve from the remaining discharge valves and in another switching position of said control valve, to unite all discharge valves for delivering all pressure fluid into said load port; said housing including a disconnectable closing member, and said multiway valve and said channel system being arranged in said closing member.

4,257,751

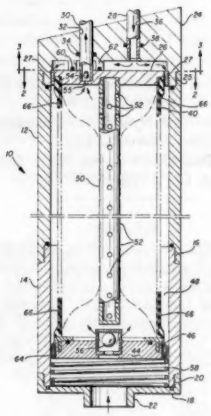
PNEUMATICALLY POWERED PUMP

William M. Kofahl, Rte. 2, Box 297, Licking, Mo. 65542

Filed Apr. 2, 1979, Ser. No. 26,288

Int. Cl.³ F04B *43/10, 45/06*

U.S. Cl. 417—394 **12 Claims**



1. A device for elevating a subsurface liquid comprising:

housing means for being placed in a well bore and submerged in the liquid;

supply means connected between said housing means and the well surface for supplying pressurized gas to said housing means;

exhaust conduit means connected to said housing means for conducting the liquid to the well surface;

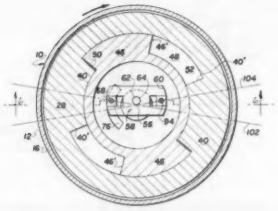
elastic cylindrical diaphragm means disposed in said housing means and in fluid communication with said exhaust conduit means, said diaphragm means being movable in response to pressure exerted by pressurized gas supplied by said supply means to the area between said diaphragm means and said pump body means for substantially collapsing said diaphragm means towards its axis for displacing liquid in said diaphragm means; and

spring means disposed in said housing means outside said diaphragm means for expanding said diaphragm means to its expanded position after the liquid is displaced.

4,257,752
ROTARY ALTERNATING PISTON MACHINE WITH COUPLING LEVER ROTATING AROUND OFFSET CRANKPIN

Raymond M. Fogarty, Trinity Towers, 3rd and Guthrie Sts., Louisville, Ky. 40202

Filed Apr. 2, 1979, Ser. No. 25,887
Int. Cl.³ F01C *1/00, 9/00;* F04C *21/00*
U.S. Cl. 418—34 **13 Claims**



1. A rotary piston machine operable with a compressible fluid and comprising in combination:

a. a housing having walls forming a circular bore,

b. an outer ring member rotatably mounted within the housing about a central axis and including at least two integral diametrically opposed inwardly directed segmental pistons,

c. a concentric inner ring member positioned within and carried by the said outer ring member and including at least two integral diametrically opposed outwardly directed segmental pistons which are interposed between the said outer pistons and define with the outer ring pistons energy chambers therebetween,

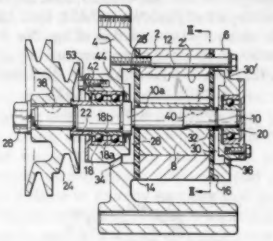
d. and an oscillating coupling means positioned within the inner ring member and rotating around a fixed offset crankpin to cause the inner ring member to accelerate with respect to the outer ring during a first one-half revolution of the coupling means to create a compression stroke on its forward side and to decelerate with respect to the outer ring during the second one-half revolution of the coupling means to create a compression stroke on its rearward side.

4,257,753
ROTARY FLUID VANE PUMP WITH MEANS PREVENTING AXIAL DISPLACEMENT OF THE DRIVE SHAFT

Hiroshi Sakamaki, Utsunomiya; Yoshiyuki Maeda, Ageo; Fumihiro Ushijima, and Tadashi Saitou, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 9, 1979, Ser. No. 2,136
Claims priority, application Japan, Jan. 27, 1978, 53-8822
Int. Cl.³ F04C *5/00, 15/00, 27/00*
U.S. Cl. 418—133 **9 Claims**

1. A rotary fluid pump comprising; a stator housing having a generally cylindrical cavity extending therethrough, a pair of recessed end heads assembled at opposite ends of the housing to form a pump cavity therewith, a drive shaft journalled in said end heads and extending eccentrically into the interior of the pump cavity, a rotor fixedly mounted on the drive shaft within the pump cavity, a pair of sealing plates individually disposed between the ends of the stator housing and the end heads to divide the pump cavity into a pair of end chambers defined by the end head recesses and the plates and an intermediate rotor chamber defined by the plates, said sealing plates of different thickness and said rotor contacts the sealing plate thicker than the other sealing plate, a plurality of vanes slidably disposed in an equal plurality of grooves radially formed in the

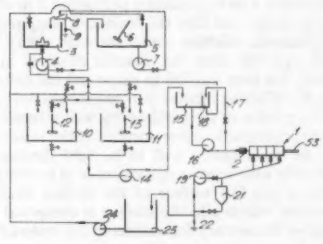


rotor, and means to prevent axial displacement of said drive shaft along the axis of rotation thereof.

4,257,754
FIBROUS MATERIAL MOULDING APPARATUS

Kieron P. Green, Thame; Bruce R. Inglis, High Wycombe; Roger A. Allen, Great Missenden, and Roger W. Tringham, Beaconsfield, all of England, assignors to Wiggins Teape Limited, Hampshire, England

Division of Ser. No. 820,388, Jul. 29, 1977. This application Feb. 16, 1979, Ser. No. 12,816
Int. Cl.³ B28B *1/26*
U.S. Cl. 425—84 **26 Claims**



1. Apparatus for forming an elongated fibrous element comprising:

foraminous belt means for providing an elongate foraminous former;

a foraminous forming chamber through which said belt means passes, said belt means being formed to a hollow shape thereby;

fluid extraction means for providing a fluid extraction zone surrounding at least part of said forming chamber, said fluid extraction zone being formed by a closed drainage casing;

means for driving said belt means through both said forming chamber and said fluid extraction means and

injection nozzle means for injecting a fibrous dispersion into said elongate foraminous former within said forming chamber, said injection nozzle means having an injection nozzle being dimensioned so as to substantially exclude an ingress of air around an interface of said injection nozzle with walls of said belt means so that the apparatus produces an elongate fibrous element having an outer core of greater density than the inner core which said outer core surrounds.

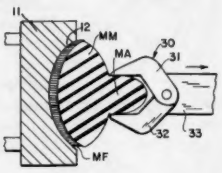
4,257,755
MOLDING SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 483,037, Jun. 25, 1974, which is a continuation-in-part of Ser. No. 297,452, Oct. 13, 1972, Pat. No. 3,820,928, which is a continuation of Ser. No. 849,014, Aug. 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 721,401, Apr. 15, 1968, Pat. No. 3,616,495. This application Jun. 5, 1978, Ser. No. 912,421

Int. Cl.³ B29C *17/02*

U.S. Cl. 425—168 **15 Claims**



1. Molding apparatus comprising in combination:

a mold having a closed molding cavity with the wall of said cavity defining a surface against which a moldable material may be formed to shape,

means for opening and closing said mold,

means for flowing a quantity of thermoplastic resin into said cavity to cause said resin to contact the wall of said cavity and to adhere to the surface of said mold cavity wall,

means for solidifying the major portion of the thermoplastic resin flowed into said mold cavity to form a molding of defined shape,

means for controlling the temperature of the surface stratum of at least a portion of the molding while it is disposed in said mold cavity to retain the material of said surface stratum in a tacky condition permitting it to adhere to the mold cavity wall after the remaining portion of the molding material solidifies within the mold cavity,

means operable after the material disposed in said mold cavity has been molded to shape and has defined a molding for effecting relative movement between said molding and a portion of the mold cavity wall wherein said means is also operable to cause portions of the material adhering to the mold cavity wall to be held thereagainst while effecting such relative movement so as to string out and to form a pile-like surface of the surface stratum of said molding which pile-like surface is composed of a multitude of filamentary formations of the material of the surface stratum of said molding.

4,257,756
APPARATUS FOR FORMING SHAPED ARTICLES

Roy A. Gasson, Crawley, England, assignor to Redifon Flight Simulation Limited, Crawley, England

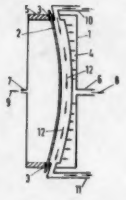
Division of Ser. No. 769,883, Feb. 23, 1977, Pat. No. 4,139,586. This application Aug. 24, 1978, Ser. No. 936,617

Claims priority, application United Kingdom, Mar. 3, 1976, 8465/76

Int. Cl.³ B29C *17/04*

U.S. Cl. 425—384 **4 Claims**

1. Apparatus for forming a shaped article by free-blowing a hot thermoplastics sheet, comprising a tank constructed to contain a volume of fluid and including clamp means for retaining the hot thermoplastic sheet around the edge thereof in such manner that the sheet divides the tank volume into first and second tank volume parts which are isolated from each other by the said sheet in the manner of a membrane therebetween; and first fluid vent means for connecting one only of said first and second tank volume parts to a fluid flow circuit, said fluid flow circuit also including fluid pump means and means for selectively heating and cooling fluid flowing in said fluid flow circuit to such temperatures that said flowing fluid selectively imparts heat to or withdraws heat from the said thermoplastic sheet while flowing through said one tank volume part, the said apparatus further comprising second vent means for connecting said first and second tank volume parts to fluid volumes at different relative pressures so as to maintain said differential fluid pressure between the two faces of said thermoplastic sheet such that said sheet, apart from said edge thereof, is maintained in spaced relationship relative to the remainder of the apparatus during free-blowing, said apparatus further comprising a male form which partially fills the said first volume part of the tank, said male form being generally of the same shape as the thermoplastic sheet when finally free-blown, said apparatus further comprising a female form which partially fills the said second volume part of the tank and which is generally of the same shape, the shaped surfaces of the said forms facing the area of the tank occupied by the thermoplastic sheet and being so arranged that the sheet, when being free-blown, touches the face of neither form.



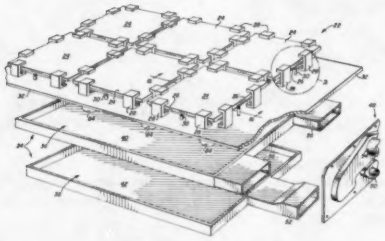
4,257,757
RADIANT COMBUSTOR ASSEMBLY

Thomas L. Ashe, and Byron B. Heath, both of Scottsdale, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 16, 1978, Ser. No. 916,165

Int. Cl.² F23D *13/12*

U.S. Cl. 431—7 **31 Claims**

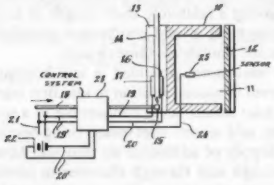


1. A radiant combustor assembly comprising a housing forming a manifold for receiving fuel and air under pressure, said manifold including a tray-like fuel plenum member having a fuel inlet, a tray-like air plenum member having an air inlet and mounted on top of said fuel plenum member to form a fuel plenum, and a backing plate mounted on top of said air plenum member to form an air plenum; a generally planar porous combustor element mounted on top of said mounting plate; and means communicating between said manifold and one side of said combustor element for directing fuel and air from said manifold toward said combustor element for passage therethrough and combustion on the other side thereof, said means including acceleration means for accelerating the fuel and air to a velocity sufficient to prevent combustion flash back.

4,257,758
SAFETY ARRANGEMENT IN A GAS OPERATED APPARATUS

Peter E. Blomberg, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Sep. 1, 1978, Ser. No. 938,772
Claims priority, application Sweden, Sep. 8, 1977, 7710072
Int. Cl.³ F23N 5/02, 5/20
U.S. Cl. 431—27 **8 Claims**

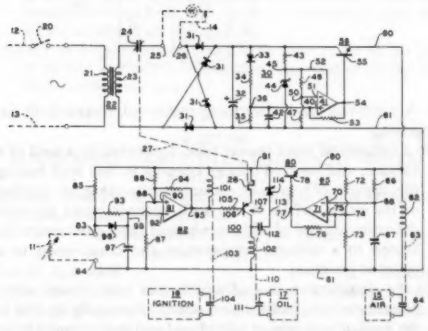


1. A control arrangement in a gas operated apparatus having a burner comprising: a gas supply conduit, a valve for said conduit, a thermostat controlled by said valve, a safety device in said conduit for the burner of said apparatus, an electric gas control circuit, a source of electrical energy connected to said gas control circuit for controlling the operation of said burner and automatically re-igniting the burner flame in the event said flame becomes extinguished, a first switch in said conduit, said thermostat being connected to said first switch so as to close said circuit when a burner flame is desired, said safety device having a valve in said circuit including a member for opening said valve in said safety device thereby permitting gas flow to said burner, an igniter and a flame detector located adjacent to said burner, and a second switch in said circuit arranged to break said circuit when said flame detector is exposed to a flame.

4,257,759
FUEL BURNER PRIMARY CONTROL MEANS

Gregory M. Miles, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 15, 1979, Ser. No. 20,698
Int. Cl.³ F23N 5/00
U.S. Cl. 431—31 **12 Claims**

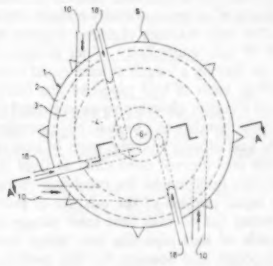


1. A fuel burner primary control adapted to respond to a condition responsive means to operate fuel burner means which includes an air source, a fuel source, an ignition means, and sensor means responsive to a flame in said burner means, including: switching voltage regulator means having a switched output connected to a power source upon operation of said condition responsive means to provide a regulated direct current output voltage when said power source is above a predetermined level; said predetermined level being selected to insure proper operation of said fuel burner primary control; said regulated output voltage providing an operating potential for said primary control and simultaneously energizing air control switch means to provide said air source to said burner means; electronic time delay switch means energized by said output voltage to provide a time delay between the application of said output voltage to said time delay switch means and the availability of said output voltage to further circuit means; flame responsive circuit means including said sensor means connected and arranged to control amplifier means; said amplifier means having output circuit means including second and third switch means; said second switch means controlled by said amplifier means to energize said second switch means from said further circuit means whenever said sensor means fails to detect a flame to thereby energize said ignition means; third switch means energized initially with said second switch means to supply said fuel source to said burner means; said third switch means including a normally open circuit which closes upon operation to latch said third switch means into an energized state from the potential from said further circuit means; and safety switch means energized concurrently with said second switch means; said safety switch means including switch contact means connected and arranged to deenergize said primary control upon the failure of a flame being sensed by said sensor means in a predetermined safe time interval.

4,257,760
CYCLONE BURNERS

Hubert G. Schuurman, 2 Bray St., Darfield; James B. Stott, 138 Totara St., and Ian A. Gilmour, 9 Sunvale Ter., both of Christchurch, all of New Zealand

Filed Jan. 4, 1979, Ser. No. 983
Claims priority, application New Zealand, Jan. 11, 1978, 186193
Int. Cl.³ F23C 5/32
U.S. Cl. 431—158 **18 Claims**

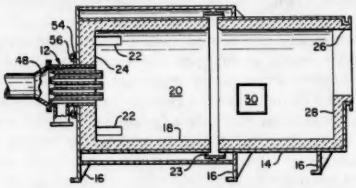


1. A cyclone burner comprising: a substantially cylindrical combustion chamber of circular or elliptical internal cross-section; a throat for conveying combustion products from the combustion chamber; at least one port in the curved internal wall of the chamber for the entry of an air/fuel mixture into said chamber, each said port being located close to the throat and entering said chamber at an angle such that in use the air/fuel mixture admitted therethrough is approximately tangential to the curved internal wall of the chamber; and at least one air inlet, each said air inlet being located closer to the throat than said port, and being arranged to admit in use to the combustion chamber a stream of air in a direction which is generally tangential to that of the combustion products moving towards the throat, and is directed so as to convey some of said combustion products towards each said air/fuel port; the number of said ports and said air inlets being governed by the internal diameter of the combustion chamber.

4,257,761
MULTIPLE JET COAL BURNER

Richard L. Musto, Homewood, Ill., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 19, 1979, Ser. No. 21,734
Int. Cl.[3] F23C 5/00
U.S. Cl. 431—174 2 Claims



1. In an air heater or small industrial furnace including a body supported on a frame structure, said body including a closed combustion chamber of restricted dimensions formed internally thereof, said body further having an opening formed in one end thereof so as to be located in coaxial alignment with the major axis of said combustion chamber, said combustion chamber being lined internally with a refractory material, the improvement comprising a burner fixedly mounted in said opening in said body operative for effecting the burning in said combustion chamber of pulverized coal with a stable flame of relatively short length so as to produce a heat input to said combustion chamber of between one million and fifty million BTU/HR, said burner comprising:

a. a housing having a hollow interior operably defining a through chamber therewithin, said through chamber having a first end and a second end, said second end being spaced in a first direction from said first end so as to thereby define the major axis of said housing;

b. first inlet means provided at said first end of said housing;

c. feed means connected in fluid flow relation to said first inlet means for feeding a previously formulated combustible mixture of pulverized coal and air to said housing;

d. a multiplicity of jet means fixedly mounted in a prescribed array within said through chamber formed in said housing, each of said multiplicity of jet means comprising a pipe-like jet having a length at least equal to the length of said housing, each of said pipe-like jets being supported within said through chamber so as to extend the length of said through chamber and so as to be in parallel relation to the major axis of said housing, each of said pipe-like jets having one end thereof connected in fluid flow relation with said first inlet means for receiving therefrom a substantially equal portion of the mixture of pulverized coal and air being fed to said first inlet means by said feed means, each of said pipe-like jets being operative as a conduit through said housing for that portion of the mixture of pulverized coal and air received at said one end thereof;

e. a deflector plate fixedly mounted to said housing so as to be interposed between said first inlet means and said one end of each of said pipe-like jets, said deflector plate having a plurality of openings formed therethrough corresponding in number to the number of said pipe-like jets, each of said plurality of openings provided in said deflector plate being aligned with said one end of each of a corresponding one of said pipe-like jets, deflector plate being operative to divide the previously formulated combustible mixture of pulverized coal and air received at said first inlet means into a plurality of smaller, substantially equal portions thereof and to guide one of the plurality of smaller, substantially equal portions of the combustible mixture of pulverized coal and air into said one end of each of a corresponding one of said pipe-like jets;

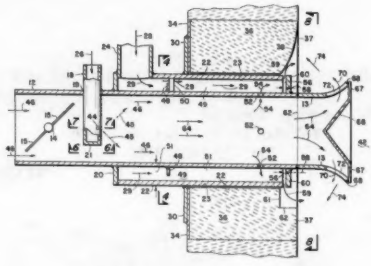
f. outlet means formed at said second end of said housing, said outlet means being connected in fluid flow relation with the other end of said pipe-like jets, said outlet means being operative to effect the collective discharge from said housing of all of the smaller, substantially equal portions of the combustible mixture of pulverized coal and air flowing through each of said pipe-like jets into said combustion chamber whereupon the collective burning of all of the smaller, substantially equal portions of the combustible mixture of pulverized coal and air is operative to provide a heat input to said combustion chamber of between one million and fifty million BTU/HR with a stable flame having a relatively short length so as to be suitable for employment in said combustion chamber despite the dimensional limitations thereof; and

g. second inlet means provided in said housing at said first end thereof in spaced relation to said first inlet means, said second inlet means being connectible to a source of additional air, said second inlet means being operative to introduce a supply of additional air into said housing for passage through said through chamber in surrounding relation to each of said pipe-like jets followed by the subsequent discharge into said combustion chamber of this additional air from said housing at said second end thereof.

4,257,762
MULTI-FUEL GAS BURNER USING PREHEATED FORCED DRAFT AIR

John S. Zink; Robert D. Reed, both of Tulsa, Okla.; Horst M. Glomm, and Klaus E. Sawatski, both of Frankfurt, Fed. Rep. of Germany, assignors to John Zink Company, Tulsa, Okla.

Filed Sep. 5, 1978, Ser. No. 939,475
Int. Cl.[3] F23C 5/08
U.S. Cl. 431—177 12 Claims



1. A multi-fuel gas burner using preheated, forced-draft air, comprising:

(a) a cylindrical inner burner tube, supported by a wall of a furnace, and inserted into an opening in said wall having tile, capable of becoming radiant, surrounding the opening on the inside surface of said wall; means to inject, through the upstream end of said inner burner tube, combustion air heated to a selected temperature and compressed to a selected pressure;

(b) the downstream end of said burner tube closed and a plurality of longitudinal slots, circumferentially spaced in the wall of said tube at said closed end and oriented so as to direct gases issuing therefrom toward said tile;

(c) an outer burner tube axially surrounding said inner burner tube, forming an annular passage therebetween;

(d) means to selectively introduce low pressure lean combustible gas into said annular passage toward the distal end thereof;

(e) means to direct said lean gas from said annular space to meet and turbulently mix with said combustion air in the vicinity of said tile to assist, after ignition, the complete combustion of said lean gas adjacent said tile, and thus

radiantly heat said wall to a temperature sufficient to maintain ignition of said lean gas-air mixture; and

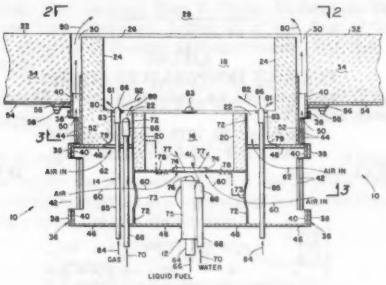
(f) means to selectively inject rich fuel gas downstreamwise, under a selected pressure and selected ratio of said lean combustible gas to said rich fuel gas, into said inner burner tube at a point downstream of said upstream end.

4,257,763

LOW NOX BURNER

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Jun. 19, 1978, Ser. No. 916,766
Int. Cl.³ F23Q 9/00
U.S. Cl. 431—188 **5 Claims**



1. A burner for minimal NOx production under varying rates of either liquid and/or gaseous fuel firing, comprising,

means defining a centrally disposed primary combustion area having means to selectively supply liquid fuel and air thereto;

means defining a secondary combustion area downstream of the primary combustion area, means defining an annular space surrounding the primary combustion area and communicating with said secondary combustion area, and having means to selectively supply gaseous fuel and air thereto;

means defining a tertiary combustion area downstream of the secondary combustion area, means defining an annular space surrounding the secondary combustion area and communicating with said tertiary combustion area and means to supply air thereto; and

means to simultaneously control the ratio of air to the primary and secondary combustion area relative to the tertiary combustion area.

4,257,764

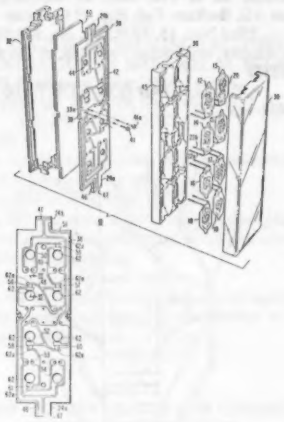
FLASH LAMP ARRAY WITH IMPROVED SWITCH MOUNTING

Nicholas J. Rainone, Clifton, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 18, 1978, Ser. No. 907,217
Int. Cl.³ F21K 5/00
U.S. Cl. 431—359 **5 Claims**

1. In combination with a flash lamp array including a plurality of flash lamps each having a vitreous envelope hermetically sealed to a pair of lead-in wires, a two-sided circuit board having sequencing circuitry including electrically conducting printed circuit branches affixed to one side thereof and having said lamps connected thereto and positioned proximate said one side of said circuit board to fire individually and in sequence, the improvement which comprises:

a plurality of solid-state thermally activated switches of predetermined composition and physical characteristics and predetermined dimensions located externally of said lamps and affixed directly to said one side of said circuit board, said composition comprising a mixture of finely divided silver carbonate, finely divided silver oxide and finely divided hydrophobic silica dispersed in an organic polymer binder, each of said switches located in close proximity to a predetermined one of said flash lamps to receive radiant thermal energy emitted by said proximate flash lamp upon its being flashed and as a result thereof to change its chemical composition from an electrically non-conductive state to an electrically conductive state, and said switches together with said electrically conducting printed circuit branches forming said sequencing cir-



cuitry, said printed circuit branches having a plurality of arm sections a pair of which are spaced and overlay each of said switches and terminate proximate each of said switches, said spaced-arm section pairs are separated by a portion of said switches, and upon being irradiated at least the exposed surface portion of said switches converts to an electrically conductive state to insure a closed electrical circuit between the overlaying spaced-arm section pairs of said sequencing circuitry.

4,257,765

COLOR CORRECTED FLASH LAMP

Ralph M. Potter, Pepper Pike, and John R. Debesis, Chagrin Falls, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,471
Int. Cl.³ F21K 5/00
U.S. Cl. 431—360 **11 Claims**

1. A color corrected flash lamp having a light-transmitting envelope operatively associated with a blue emitting organic phosphor medium which upon exposure to the radiation being emitted by said flash lamp increases the total light output of

said combination and lowers the Spectral Distribution Index thereby and a combustible light producing material in said envelope.

4,257,766

PROCESSES AND APPARATUS FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIAL

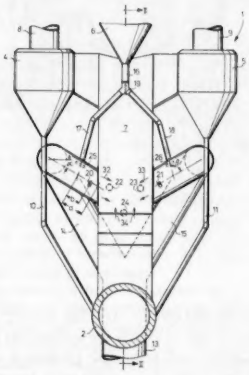
Horst Ritzmann, Enniger; Klaus Bauer, Oelde; Heinz-Herbert Schmits, Rheda; Wolf Goldmann, and Hennig Korn, both of Neubeckum, all of Fed. Rep. of Germany, assignors to Polysius AG, Beckum, Fed. Rep. of Germany

Filed Nov. 15, 1978, Ser. No. 960,939

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1977, 2752323

Int. Cl.³ C04B 7/36; F27B 15/00

U.S. Cl. 432—14 **21 Claims**



1. In a process for the heat treatment of fine-grained material such as cement wherein the material is preheated by kiln exhaust gases in a multistage cyclone preheater, further heated in a precalcination zone, burned in a kiln below said preheater, and cooled in a cooler, and wherein a cooling gas stream from the cooler is introduced into a gas pipe connecting the kiln to the preheater and through which the kiln exhaust gases flow upwardly toward the preheater, said gas pipe defining said precalcination zone between said kiln and said preheater, the improvement comprising dividing the cooling gas stream into a plurality of component streams; introducing said component streams into said gas pipe at peripherally spaced points in the region of said precalcination zone and at a downward inclination to the horizontal introducing preheated material from the penultimate cyclone stage of the preheater into each of said component streams upstream from said gas pipe; and combusting fuel in said precalcination zone.

9. In apparatus for the heat treatment of fine-grained material such as cement having a multistage cyclone preheater for preheating such material, a kiln below said preheater for burning such material, a cooler for cooling burned material, a gas pipe extending between said kiln and said preheater for conducting kiln exhaust gases upwardly toward said preheater and forming a precalcining zone between said kiln and said preheater, and conduit means extending between said cooler and said gas pipe for delivering cooling gas to the latter, the improvement wherein said conduit means comprises a plurality of branches communicating with said gas pipe at peripherally spaced points in the region of said precalcination zone and downwardly inclined to the horizontal; means for delivering preheated material from the penultimate cyclone stage of said preheater to each of said branches and upstream from said gas pipe; and means for introducing fuel into said precalcining zone.

4,257,767

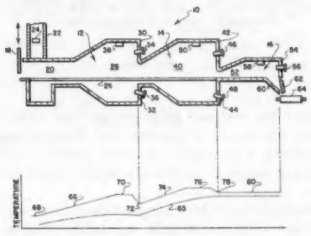
FURNACE TEMPERATURE CONTROL

John C. Price, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Apr. 30, 1979, Ser. No. 35,023

Int. Cl.³ F27D 7/00; C21B 7/24

U.S. Cl. 432—24 **16 Claims**



1. In a slab reheat furnace having at least one zone with a controllable heating means through which metal slabs are moved, a method of controlling the heating means, comprising the steps of:

(a) predicting the average temperature of each slab in the zone;

(b) establishing a deviation between the predicted average temperature of each slab and a desired average temperature of each slab for the particular location of each slab in the zone;

(c) identifying the slab whose temperature deviation is such that the slab will require the greatest amount of time to be heated to the desired average temperature; and,

(d) adjusting the output of the heating means to such an extent that the identified slab will be heated to the desired average temperature.

4,257,768

NOVEL BLEND OF ALGIN AND TKP

Joseph S. Racciato, San Diego, and Robert I. Yin, La Jolla, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 9, 1978, Ser. No. 959,121
Int. Cl.[3] C08L 5/04; D06P 1/46
U.S. Cl. 8—561 22 Claims

1. A blend of algin and TKP wherein the weight:weight ratio of algin to TKP ranges from about 90:10 to 5:95.

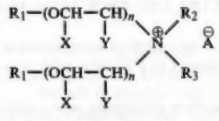
4,257,769

USE OF QUATERNARY ETHER AMINES AS FIBER PROCESSING AGENTS

Rolf Kleber, Neu-Isenburg; Hans L. Panke, Hofheim am Taunus, and Erich Hoffmann, Kriftel, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 2, 1979, Ser. No. 81,073
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843659
Int. Cl.[3] D06M 13/34, 13/46
U.S. Cl. 8—188 3 Claims

1. Process for the processing of native and synthetic fibers which comprises applying as processing agent onto the fibers a quaternary ether amine of the formula I



(I)

in which R_1 is a saturated or unsaturated alkyl radical of from 12 to 24 carbon atoms, X and Y stand for hydrogen or methyl, but do not both represent methyl at the same time, n is a number of from 1 to 5, R_2 and R_3 stand for alkyl of from 1 to 4 carbon atoms, and A is the methosulfate, chloride, or the dimetho- or triethophosphate anion.

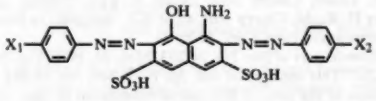
4,257,770

DISAZO DYE COMPOSITION

Nobuzi Nishimura, Toyonaka; Masayuki Tsuji, Kobe; Seizo Konishi, Minoo; Tadashi Yamamoto, Toyonaka; Takemi Tokieda, Nara; Utazi Sawa, Nara, and Suketsugu Koumura, Hirakata, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

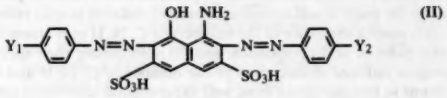
Filed Jul. 16, 1979, Ser. No. 57,818
Claims priority, application Japan, Jul. 21, 1978, 53-89715
Int. Cl.[3] C09B 62/00, 27/00
U.S. Cl. 8—549 12 Claims

1. A dye composition comprising at least one disazo dye of the formula (I) expressed in the form of a free acid,



(I)

wherein each X_1 and X_2 is $-SO_2CH_2CH_2OCOCH_3$, $-SO_2CH_2CH_2OSO_3H$ or $-SO_2CH{=}CH_2$, provided that at least one of X_1 and X_2 is $-SO_2CH_2CH_2OCOCH_3$, and at least one disazo dye of the formula (II) expressed in the form of a free acid,



(II)

wherein each Y_1 and Y_2 is $-SO_2CH_2CH_2OSO_3H$, $-SO_2CH{=}CH_2$ or $-SO_2CH_2CH_2OH$, provided that one of Y_1 and Y_2 is $-SO_2CH_2CH_2OSO_3H$ or $-SO_2CH{=}CH_2$.

4,257,771

PROCESS FOR MEASURING LECITHIN CONCENTRATION IN BIOLOGICAL FLUIDS

Hugh Yee, 4201 Frostwood, Troy, Mich. 48098

Filed Apr. 30, 1979, Ser. No. 34,597
Int. Cl.[3] G01N 33/92, 31/08
U.S. Cl. 23—230 B 9 Claims

1. A process for determining the lecithin concentration in a biological fluid, comprising the steps of:

(a) separating the lecithin from the fluid;

(b) isolating the separated lecithin from similar phospholipids by passing the extract through a column containing a specific adsorbent material;

(c) hydrolyzing the separated lecithin;

(d) forming the separated lecithin into chromogens; and

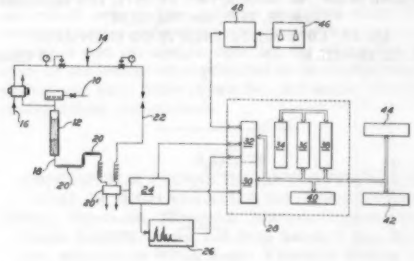
(e) evaluating the concentration of the lecithin by spectrophotometric measurement.

4,257,772

METHOD AND APPARATUS FOR CHEMICAL ANALYSIS OF SPECIMENS

Franco Bognin, San Bonifacio, and Bruno Colombo, Cologno Monzesz, both of Italy, assignors to Carlo Erba Strumentazione S.p.A., Italy

Filed May 7, 1979, Ser. No. 36,333
Claims priority, application Italy, May 16, 1978, 23442 A/78
Int. Cl.[3] G01N 31/08; G06G 7/75; G01N 31/12
U.S. Cl. 23—230 PC 8 Claims



1. A method for determining the reduced atomic ratios of C, N, H and S in a substance, said method comprising (1) decomposing the substance into compounds corresponding respectively to the C, N, H and S atoms in such substance; (2) separating said compounds; (3) detecting the respective amount of each separated compound and providing continuous outputs whose values form a curve having peaks defining an area thereunder, said peaks having positions along said curve identifying the compounds and said area under each identifying peak defining the amount of the compound represented by each identifying peak; (4) determining the area under each identifying peak to obtain an experimental area value for each compound, (5) storing said experimental area values in a memory; (6) selectively reading out pairs of said experimental area values from said memory; (7) determining experimental area ratios from said pairs of experimental area values; (8) storing prede-

termined correlations between (a) predetermined ratios of peak areas for pairs of said compounds and (b) reduced atomic ratios representing the ratios of the numbers of C, N, H or S atoms in said pairs of said compounds; and (9) determining the experimental reduced atomic ratio of the number of C, N, H and S atoms in said substance from said experimental area ratios and said stored predetermined correlations.

6. An apparatus for determining the reduced atomic ratios of C, N, H and S in a substance, said apparatus comprising (1) means for decomposing the substance into compounds corresponding respectively to the C, N, H and S atoms in such substance; (2) means for separating said compounds; (3) means for detecting the respective amount of each separated compound and providing continuous outputs whose values form a curve having peaks defining an area thereunder, said peaks having positions along said curve identifying the compounds and said area under each identifying peak defining the amount of the compound represented by each identifying peak; (4) means for determining the area under each identifying peak to obtain an experimental area value for each compound, (5) memory means for storing said experimental area values in said memory means; (6) means for selectively reading out pairs of said experimental area values from said memory means; (7) means for determining experimental area ratios from said pairs of experimental area values; (8) read only memory means for storing predetermined correlations between (a) predetermined ratios of peak areas for pairs of said compounds and (b) reduced atomic ratios representing the ratios of the numbers of C, N, H, or S atoms in said pairs of said compounds; and (9) means, responsive to said means for determining experimental area ratios and to said read only memory means, for determining the experimental reduced atomic ratio of the number of C, N, H and S atoms in said substance from said experimental area ratios and said predetermined correlations.

4,257,773

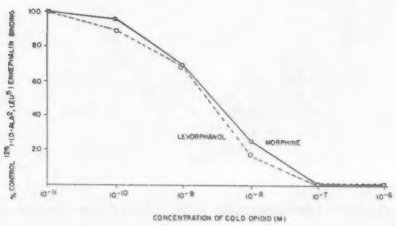
ASSAY METHOD AND COMPOUNDS

Richard J. Miller, Raleigh; Kwen-Jen Chang, and Pedro Cuatrecasas, both of Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 841,678, Oct. 13, 1977. This application Jun. 28, 1979, Ser. No. 52,967

Int. Cl.³ C07C *103/52;* **A61K** *43/00;* **G01N** *33/68*

U.S. Cl. 23—230 B **15 Claims**



1. An assay method for opioid activity comprising the steps of

(a) incubating together an opiate receptor material, a radioiodinated compound of formula (I):

$$H—X^1—X^2—X^3—X^4—(X^5)_m—(X^6)_n—OH \quad (I)$$

wherein

X^1 is selected from L-tyrosyl and N-alkyl-L-tyrosyl (wherein the alkyl has 1 to 4 carbon atoms) substituted in the phenol moiety at the 2-position or at both the 2- and 6-positions (with respect to the hydroxy group) with an iodine radioisotope;

X^2 is selected from glycyl and D-alanyl;

X^3 is selected from glycyl and L-alanyl;

X^4 is selected from L-phenylalanyl and L-4-chlorophenylalanyl;

X^5 is selected from L-leucyl, D-leucyl, L-methionyl, D-methionyl, L-valyl, D-valyl, L-norleucyl, D-norleucyl, L-threonyl and D-threonyl;

X^6 is L-threonyl;

and m and n are each selected from 0 and I, provided that when they are both 0 then X^2 is D-alanyl; together with their salts, esters, amides and N-alkylamides wherein the alkyl has 1 to 4 carbon atoms, and a liquid sample;

(b) measuring the percentage inhibition of the binding of the radio-iodinated compound to the opiate receptor material; and

(c) determining the opioid activity of the liquid sample using the percentage inhibition measurement.

4,257,774

INTERCALATION INHIBITION ASSAY FOR COMPOUNDS THAT INTERACT WITH DNA OR RNA

Carol L. Richardson, Springfield, and Gail E. Schulman, Alexandria, both of Va., assignors to Meloy Laboratories, Inc., Springfield, Va.

Filed Jul. 16, 1979, Ser. No. 57,739

Int. Cl.³ C12Q *1/68;* **G01N** *33/16, 31/22*

U.S. Cl. 23—230 B **4 Claims**

1. A process for the quantitative determination of the extent of binding of a compound to a nucleic acid, which comprises the steps:

(a) preparing a mixture containing said compound and an intercalator, said intercalator being selected from the group consisting of ethidium bromide, actinomycin D, proflavin and acridine orange, and determining the fluorescent polarization of said mixture;

(b) adding the mixture of the compound and the intercalator to a nucleic acid under conditions suitable for the binding of both the compound and the intercalator to the nucleic acid, and determining the fluorescent polarization of the mixture containing the compound, the intercalator and the nucleic acid; and

(c) determining the extent of binding of the compound to the nucleic acid from the difference in the fluorescent polarization of the mixture containing the compound and the intercalator and the mixture containing compound, the intercalator and the nucleic acid.

4,257,775

DETERMINATION OF WATER CONTENT IN VARIOUS SYSTEMS

Edwin N. Ladov, Cherry Hill; Derek A. Law, Pitman, and Guenter H. Kuehl, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 24,233, Mar. 26, 1979, Pat. No. 4,198,207. This application Jul. 30, 1979, Ser. No. 61,582

The portion of the term of this patent subsequent to Apr. 15, 1997, has been disclaimed.

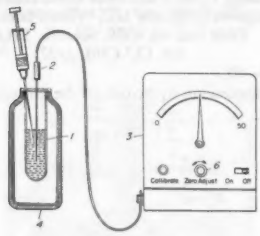
Int. Cl.³ G01N *25/56, 33/18, 33/28*

U.S. Cl. 23—230 HC **10 Claims**

1. A method of determining water in the presence of another substance which comprises

(a) bringing a sample comprising a water-containing material

into contact with an adsorbent solid whereby the water adsorption causes a rise in temperature,



(b) providing a means for measuring the temperature rise in terms of percentage by weight of water and

(c) determining the percentage of water in the sample.

4,257,776

METHOD OF VISUALLY DETECTING ANTIOXIDANT IN AN ORGANIC MIXTURE

William L. Porter, Cambridge, and Roslyn E. Kramer, Boston, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 21, 1980, Ser. No. 114,035

Int. Cl.³ G01N *31/06, 31/08*

U.S. Cl. 23—230 M **4 Claims**

1. A method of visually detecting the antioxidant gallic acid in a mixture of organic compounds which comprises the steps of:

a. separating a mixture of organic compounds into its component compounds by thin layer chromatography by contacting a mixture of organic compounds suspected of containing the antioxidant gallic acid with a polyamide-coated plate, said polyamide-coated plate comprising a sheet or plastic or glass supporting a coating of powdered polyamide of about 100 to about 120 microns thickness, said polyamide being polymerized epsilon-caprolactam, said mixture of organic compounds being separated on said polyamide-coated plate into at least two spaced-apart spots, each of said spots being the site of a different compound from the others of said spots;

b. depositing a thin layer of linoleic acid over each of said spaced-apart spots;

c. placing said polyamide-coated plate, containing said linoleic acid deposited thereon, in an oven at about 65° C. and heating said polyamide-coated plate for at least 8 hours at about 65° C.;

d. removing said polyamide-coated plate from said oven; and

e. observing said spots and the adjacent areas of said polyamide-coated plate for color differences in reflected light, the presence of a creamy-white or yellow color where one of said spaced-apart spots was located surrounded by a brown field indicating the presence of an antioxidant in the creamy-white or yellow spot, a solid brown field lacking any creamy-white or yellow color indicating the absence of antioxidant from said one of said spaced apart spots.

4,257,777

GAS DETECTION

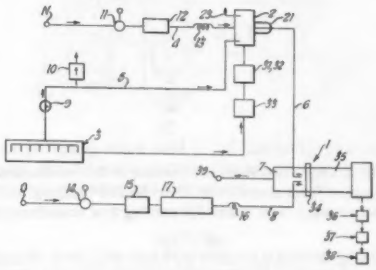
Harry F. D. Dymond, Southampton, and Albert E. Yallup, Totton, both of England, assignors to British-American Tobacco Company Limited, London, England

Continuation of Ser. No. 891,500, Mar. 30, 1978, abandoned. This application Jul. 20, 1979, Ser. No. 59,372

Claims priority, application United Kingdom, Apr. 12, 1977, 15131/77

Int. Cl.³ G01N *21/76*

U.S. Cl. 23—232 E **5 Claims**



4. A method for the detection of nitric oxide in a gas mixture, which comprises: withdrawing from a source thereof a gas mixture suspected of containing nitric oxide, continuously passing an inert carried gas to and through a sampling valve and a reaction chamber, shifting said sampling valve to a first position, passing said gas mixture to said valve and passing said carrier gas through a by-pass passage in said valve during the maintenance of said valve in said first position without any intermixing between said carrier gas and said gas mixture, shifting said valve to a second position to seal and isolate a sample of a predetermined amount of said gas mixture thereto and to divert said by-passed carrier gas stream to said isolated gas sample, sweeping said isolated sample from said valve as a discrete sample in said continuous flow of said carrier gas into and out of said reaction chamber, supplying ozone to said reaction chamber and reacting said ozone with any nitric oxide present in said gas sample, detecting the presence of nitric oxide by the luminescence produced in the reacting step, and shifting said valve between said first and second positions at predetermined time intervals.

4,257,778

PROCESS FOR PRODUCING SYNTHETIC COKING COAL OF HIGH VOLATILE MATTER CONTENT

Tadashi Murakami, Hiratsuka; Mamoru Yamane, Sayama; Toshio Tokairin, Urawa, and Kenji Kawai, Tokyo, all of Japan, assignors to Nihon Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1979, Ser. No. 70,469

Claims priority, application Japan, Jul. 31, 1979, 54/96795

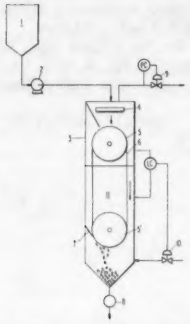
Int. Cl.³ C10G *9/14;* **C10M** *7/00*

U.S. Cl. 44—1 R **9 Claims**

1. A process for producing a synthetic coking coal of high volatile matter content by thermal cracking of a heavy hydrocarbon through the delayed coking process, said process comprising heating said heavy hyrocarbon in a furnace to a temperature between about 380° C. and 500° C. and sufficient to initiate cracking; introducing said heated heavy hydrocarbon into a coking drum where it is maintained at a temperature and for a time sufficient to effect cracking to thereby produce a thermally cracked residue having a volatile matter content of from about 25 to 45 wt% and a Gieseler fluidity of at least about 50,000 ddpm; withdrawing said thermally cracked residue in the form of a viscous liquid or slurry from the coking drum at a temperature satisfying the relation:

$T \leqq 0.293x^2 - 26.12x + 790$

wherein T is the temperature (°C.) of the thermally cracked



residue; x is the volatile matter content of the residue and is in the range of from about 25 to 45 wt%, and bringing said residue into contact with water for cooling and solidification.

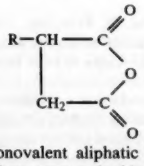
4,257,779

HYDROCARBYLSUCCINIC ANHYDRIDE AND AMINOTRIAZOLE REACTION PRODUCT ADDITIVE FOR FUEL AND MINERAL OILS

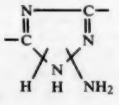
Rodney L. Sung; William P. Cullen, both of Fishkill, and Peter Dorn, Lagrangeville, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,963
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—63 **7 Claims**

1. A fuel composition comprising a mixture of hydrocarbons boiling in the range from about 90° to 450° F. containing from about 0.01 to 0.25 weight percent of the reaction product of a hydrocarbylsuccinic anhydride and an aminotriazole, said reaction product being obtained by reacting from 0.5 to 1.5 moles of said aminotriazole per mole of said hydrocarbylsuccinic anhydride at a temperature in the range from about 20° to 150° C., said hydrocarbyl succinic anhydride being represented by the formula:



in which R is a monovalent aliphatic hydrocarbon radical having at least 60 carbon atoms and said aminotriazole is represented by the formula:



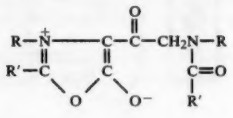
4,257,780

FUEL COMPOSITIONS CONTAINING OXAZOLONIUM HYDROXIDES

Rodney L. Sung, Fishkill, and Peter Dorn, Lagrangeville, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 10, 1979, Ser. No. 101,651
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—63 **8 Claims**

1. An oxazolonium hydroxide of the formula:



wherein R is a hydrocarbyl radical having from 1 to 5 carbon atoms and R′ is a hydrocarbyl radical having from 10 to 20 carbon atoms.

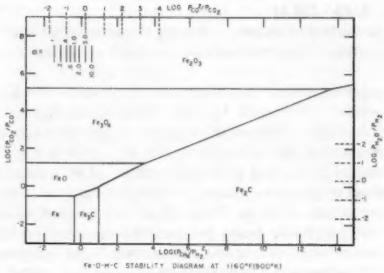
4. A motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range containing a detergent and corrosion inhibiting amount of a compound of claim **1**.

4,257,781

PROCESS FOR ENHANCING THE FUEL VALUE OF LOW BTU GAS

Frank M. Stephens, Jr., Lakewood, Colo., assignor to Hazen Research, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 817,576, Jul. 21, 1977, Pat. No. 4,134,907. This application Jan. 12, 1979, Ser. No. 2,956
The portion of the term of this patent subsequent to Jan. 16, 1996, has been disclaimed.
Int. Cl.³ C10K *3/04*
U.S. Cl. 48—197 R **34 Claims**



1. A process for producing methane in a single reaction zone in the presence of iron, Fe_3C, carbon monoxide, carbon dioxide, hydrogen and water comprising:

(a) maintaining in a fluidized bed, iron and Fe_3C in a single reactor without substantial further additions of iron and/or Fe_3C to the reactor;

(b) introducing a gas mixture containing carbon monoxide and hydrogen into the reactor;

(c) reacting the iron and Fe_3C with the carbon monoxide and hydrogen and balancing the ratio of carbon monoxide, hydrogen, carbon dioxide, water and methane under conditions such that a portion of the carbon monoxide is reduced to carbon, iron is reacted with the carbon to produce Fe_3C, and the Fe_3C is reacted with hydrogen to form methane and reform iron;

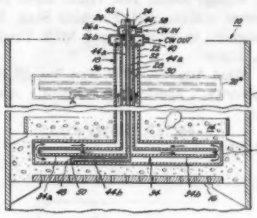
(d) removing water and/or carbon dioxide; via a recycle gas stream; and

(e) recovering methane from the reactor.

4,257,782
COAL GASIFICATION PROCESS

Donald E. Woodmansee, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 27, 1979, Ser. No. 70,637
Int. Cl.[3] C10J 3/16
U.S. Cl. 48—200 6 Claims



1. In a fixed-bed process for pressure gasification of coal wherein:

(A) a pressurized gaseous mixture comprising water vapor and free oxygen is introduced into a lower zone of the coal bed and passed upwardly through the bed;

(B) coal is introduced into an upper zone of the bed and passed therefrom downwardly through the bed in countercurrent contact with the upwardly passing gaseous mixture such that the coal is successively passed through a devolatilization zone, a reduction zone, and oxidation zone and an ash zone with the temperature of said gaseous mixture exhibiting a maximum at a maximum-temperature location intermediate said devolatilization zone and said ash zone;

(C) a raw gaseous fuel is removed from said upper zone, said raw fuel containing water and at least one hydrocarbon in the group consisting of tar and oil; and

(D) the coal at or above said maximum-temperature location is agitated by rotating a stirring means therein;

the improvement comprising the steps of:

(1) removing at least a portion of said hydrocarbon from said raw gaseous fuel;

(2) providing a conduit in said stirring means and thermally insulating said conduit to substantially prevent the cracking into coke of hydrocarbon passed therethrough; and

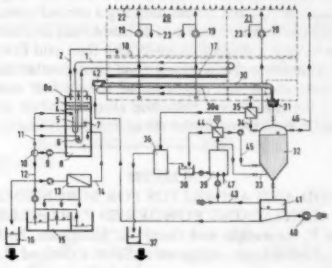
(3) introducing said removed hydrocarbon into said bed at or above said maximum-temperature location by locating the outlet of said thermally insulated conduit thereat and passing the removed hydrocarbon through said conduit, whereby the introduced hydrocarbon is cracked into lower molecular weight products with at least a portion thereof remaining in the gaseous fuel resulting from said removing step.

4,257,783
METHOD OF AND A DEVICE FOR SEPARATING PAINT RESIDUALS AND SOLVENTS FROM THE EXHAUST AIR OF A PAINT SPRAY CHAMBER

Rolf Gutjahr, Hirschlanden, and Satpal Bhatnagar, Rosswag, both of Fed. Rep. of Germany, assignors to Otto Dürr Anlagenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 26, 1978, Ser. No. 910,022
Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2723988
Int. Cl.[3] B01D 53/08, 50/00; B03C 3/10
U.S. Cl. 55—61 67 Claims

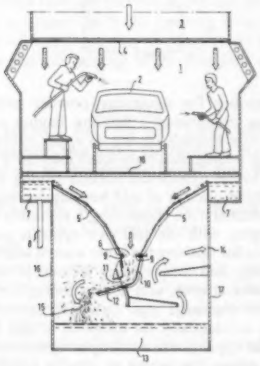
56. A method of removing solvent particles from an air stream comprising the steps of passing said stream through an adsorption layer of activated carbon which adsorbs the solvent particles, discharging the adsorption layer from the air stream, exposing the activated carbon of said adsorption layer to a desorption process in which the adsorbed solvent particles are separated from the activated carbon; separating carbon dust resulting during the desorption process from the activated carbon and applying the carbon dust as a fuel in a steam generator for providing steam used in the desorption process; and returning the activated carbon obtained in said desorption process into said stream of exhaust air.



4,257,784
METHOD AND APPARATUS FOR CLEANING USED AIR FROM SPRAY BOOTHS WHEREIN ARTICLES ARE LACQUERED

Rainer Gebhard, Haussen, and Hans Wagner, Butzbach, both of Fed. Rep. of Germany, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Apr. 3, 1979, Ser. No. 26,658
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1978, 2314276
Int. Cl.[3] B01D 47/10
U.S. Cl. 55—84 13 Claims



1. A method of cleaning used air from a spray booth wherein articles are lacquered, comprising the steps of providing a flow of used air from said spray booth, directing said flow of used air through a first constriction, bringing washing fluid into contact with said flow of used air at said first constriction to thereby wet the lacquer particles in said flow of used air, deflecting said flow of used air and said washing fluid downstream of said first constriction through an angle of approximately 90°, and thereafter subjecting said flow of used air and said washing fluid to a second constriction which is narrower than said first constriction to atomize said washing fluid to a greater extent than any atomization which might occur at the first constriction and to mix said washing fluid intimately with said flow of used air, whereby the noise level from the second constriction is reduced in the spray booth.

7. Apparatus for cleaning used air from a spray booth

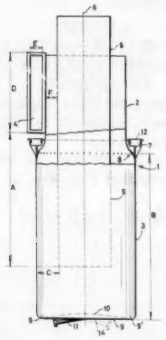
wherein articles are lacquered, comprising a Venturi duct, means defining a first constriction in the duct, means for supplying washing fluid to said first constriction, wherein the washing fluid mixes with the used air, a guide conduit downstream of said constriction, said guide conduit having a bend of approximately 90°, and means defining a second constriction in said guide conduit downstream of said bend, said second constriction having a smaller cross-section than said first constriction for atomizing the washing fluid to a greater extent than any atomization which might occur at said first constriction, whereby the noise level from the atomization at the second constriction is reduced in the spray booth.

4,257,785

METHOD AND APPARATUS FOR SCRUBBING A GAS CONTAINING POWDERED PARTICLES

Bastiaan P. Eversdijk, and Gerrit G. Kamphuts, both of Gorredijk, Netherlands, assignors to Stork Friesland B.V., Netherlands

Filed Jun. 27, 1979, Ser. No. 52,817
Int. Cl.³ B01D *45/10*; A23B *4/04*
U.S. Cl. 55—89 **6 Claims**



1. An apparatus for separating powder particles from a stream of gas, comprising a housing having a substantially vertical axis, said housing having an upper cylindrical portion provided with a tangentially directed inlet for a stream of gas and a wider lower cylindrical portion having a bottom; said lower cylindrical portion of said housing having a horizontal annular transitional zone comprising a smoothly curved, conical wall merging with the said two opposite portions of the housing, means for flushing the inner wall of said lower portion of said housing, said means being located in said horizontal annular transitional zone, said housing being further provided with a vertical discharge pipe extending centrally inside the housing from substantially the midpoint of said lower portion up through the upper portion and opening outside the housing, said flushing means comprising an annular gutter containing a moistening fluid with a plurality of passages extending through the conical wall to the transitional zone of the housing, and opening flush with the inner wall of said lower portion, to direct said fluid onto said inner wall.

6. In a method of scrubbing a gas for removal of powdered particles therefrom, wherein a wall surface within a flushing zone in contact with said gas, is flushed with a moistening fluid under a temperature lower than that of the gas supplied from a source externally of the flushing zone, and wherein said moistening fluid is collected within said zone after contact with the gas, the steps of:

dividing flow of the moistening fluid from the source into two flow paths at said lower temperature;

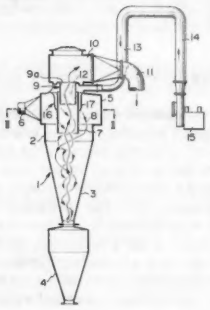
conducting the moistening fluid along one of said flow paths to the flushing zone within which the fluid is heated to a higher temperature by contact with the gas; and mixing the fluid conducted along the other of the flow paths under said lower temperature with the collected fluid within the zone for cooling thereof.

4,257,786

CYCLONE SEPARATOR

Yukio Sogo, Atsugi; Kazuo Ido, Hino; Kozo Taneda, Kodaira; Katzuji Sakai, Chiba, and Yoichiro Sato, Matsudo, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido, Japan

Filed Aug. 23, 1979, Ser. No. 69,167
Claims priority, application Japan, Aug. 28, 1978, 53/117528[U]
Int. Cl.³ B01D *45/12*
U.S. Cl. 55—261 **4 Claims**



1. A cyclone separator which includes a separating tower defining a separating chamber therein, inlet means for introducing particle laden gas into the separating chamber at an upper portion thereof in such a manner that the introduced gas forms a spiral downward flow along an inner wall surface of the separating tower and then it is turned in its direction of flow to form a spiral upward flow substantially along a center portion thereof, and outlet pipe means disposed in the upper portion of the separating chamber for allowing the spiral upward flow of gas to pass therethrough said outlet pipe means comprising at least two co-axial outlet pipes radially separated from each other to form an annular passage therebetween, said annual passage being connected to a pressurized gas supplying means for producing a downward flow in said annular passage to blow down the outermost portion of the spiral upward in said outlet pipe means to said separating chamber, and accelerating gas ejecting means provided on the outer surface of an upper portion of the outermost pipe of said outlet pipe means and connected to said pressurized gas supplying means to discharge accelerating gas along the outer surface of said outermost outlet pipe means in the same direction as the rotational direction of the spiral downward flow while disturbing the outer surface of said outermost outlet pipe means to prevent formation of a boundary layer on the outer surface of said outermost outlet pipe means.

4,257,787

AUXILIARY DISPENSING DEVICE FOR AIR TREATMENT

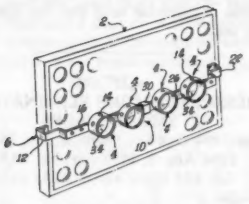
Christine S. Taylor, 631 E. Florence Ave., West Covina, Calif. 91790

Filed Oct. 19, 1979, Ser. No. 86,593
Int. Cl.³ B01D *46/10*
U.S. Cl. 55—279 **7 Claims**

1. A dispensing device for mounting cakes of air treatment

materials on filter panels in air distribution systems, comprising:

bracket means adapted to be secured to an air filter panel,



a plurality of open cups for receiving said cakes of treatment material, and

coupling means for securing the cups to the bracket means.

4,257,788

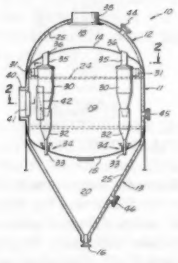
POWER RECOVERY HOT GAS SEPARATOR

Nicholas Nassir, 616 N. Hidalgo Ave., Alhambra, Calif. 91801

Continuation-in-part of Ser. No. 30,025, Apr. 16, 1979, abandoned. This application Dec. 31, 1979, Ser. No. 108,808

Int. Cl.³ B01D *45/12*

U.S. Cl. 55—346 **25 Claims**



1. A high temperature high pressure gas separator suitable for use under load at pressures of 30 to 40 psig normally at temperatures of 1200° to 1300° F. and transient temperatures of up to 2600° F. and adapted to supply hot, clean pressurized gas to a gas expander of power recovery equipment comprising:

an upright carbon steel housing lined interiorly thereof with refractory material;

a plurality of spaced-apart flanged and dished heads of heat resistant metal extending crosswise of said housing thereby dividing the same into an inlet chamber located between an overhead chamber and an underlying underflow chamber, the inner surfaces of said flanges being covered with said refractory material and the peripheral edge of said flanges being welded to the sidewall of said housing in annular areas spaced inwardly from the opposite ends of said housing whereby substantially greater temperature rises in said heads than in said housing will cause said heads to bulge and to place the adjacent sidewall portions of said housing in hoop tension and whereby the thermal expansion of said heads will occur symmetrically and uniformly across the full area thereof thereby avoiding warpage and buckling due to thermal expansion stresses;

a plurality of inertial type gas and particulate separator means in said inlet chamber having their opposite ends opening through a respective one of said heads, and each of said opposite ends discharging solely into a respective one of said overhead and underflow chambers through a valveless unrestricted coaxial outlet;

particulate-laden gas inlet means free of connection to either of said dished heads and opening into said inlet chamber through the sidewall of said housing in an area between said dished heads; and

clean gas outlet means for said overhead chamber.

4,257,789

COMBINATION VACUUM CLEANER AND DUST CONTAINER

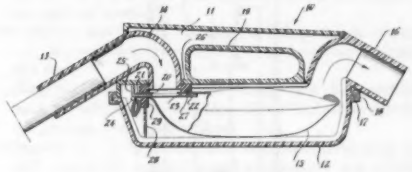
Karl E. Leinfelt, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Jun. 7, 1979, Ser. No. 46,305

Claims priority, application Sweden, Jun. 12, 1978, 7806770

Int. Cl.³ B01D *46/02*; A47L *9/14*

U.S. Cl. 55—378 **7 Claims**



1. A combination of a vacuum cleaner having a housing with a suction conduit entering therein and a dust filter container comprising: a support structure in said housing having a projecting member being provided with a hole, an opening in said dust filter container which is adapted to communicate with said suction conduit when said dust container is inserted in said vacuum cleaner housing and on said support structure, a slot in said dust filter container adjacent to said opening, an annular flange on the interior end of suction conduit, a seal arranged in said housing between said annular flange and a portion of said dust filter container surrounding said hole, and said projecting member is inserted through said slot in the dust container such that said hole is aligned with the opening in said dust filter container and whereby said seal is compressed between said annular flange and said portion of the dust filter container.

4,257,790

QUICK CHANGE FILTER BAG ARRANGEMENT

Dwight H. Bergquist, and Gary D. Lorimor, both of Omaha, Nebr., assignors to Henningsen Foods, Inc., White Plains, N.Y.

Filed Oct. 10, 1979, Ser. No. 83,395

Int. Cl.³ B01D *46/02*

U.S. Cl. 55—379 **8 Claims**

1. An improved bag assembly for filter bag collectors which have an apertured air exit plate with nozzle members at each aperture, said bag assembly comprising the combination of:

a frame-like cage member;

means for removably attaching the cage member to one of said nozzles;

a sealing ring (resiliently mounted on said cage member);

means for resiliently mounting said sealing ring on said cage member;

a resilient washer positioned on said sealing ring for forming a seal between said sealing ring and said nozzle member;

a filter bag mounted on said cage; and

means for forming a releasable and airtight connection between said filter bag and said sealing ring.

6. An improved bag assembly for filter bag collectors which have an apertured air exit plate with nozzle members at each aperture said bag assembly comprising the combination of:

a frame-like cage member having a top plate with an annular flange and a cage bottom and a plurality of rods connnecting said top plate and said bottom;

means for movably attaching the cage member to one of said nozzles;

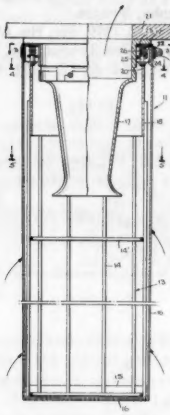
a sealing ring;

means for resiliently mounting said sealing ring on said cage member;

a resilient washer positioned on said sealing ring for forming a seal between said sealing ring and said nozzle member;

a filter bag mounted on said cage;

a clamping ring forming a releasable and airtight connection between said filter bag and said top plate; and



said resilient means comprising a plurality of apertures in said annular flange, a bolt passing through each aperture and coupled to said sealing ring, and a spring surrounding each bolt and positioned between said annular flange and said sealing ring.

4,257,791

FILTER

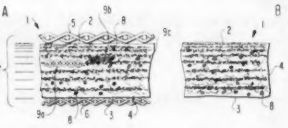
Stephen A. Wald, Winston-Salem, N.C., assignor to Lydall, Inc., Manchester, Conn.

Division of Ser. No. 752,884, Dec. 21, 1976, Pat. No. 4,164,400. This application Aug. 10, 1979, Ser. No. 65,529

The portion of the term of this patent subsequent to Aug. 14, 1996, has been disclaimed.

Int. Cl.³ B01D *46/00*

U.S. Cl. 55—382 **27 Claims**



1. A filter for separating suspended solid particulate matter comprising an intake means, a filter means and a discharge means, for passing the suspended solid particulate matter to the filter means and collecting the solid particulate matter on the filter means, said filter means comprising a non-woven needled textile filter fabric having at least 5,000 needle punches per square inch and constructed from a batt of staple textile fibers and said fabric having on an all-fiber basis:

(a) a face surface associated with the discharge means and a back surface associated with the intake means;

(b) an overall bulk density of at least 6 pounds per cubic foot;

(c) a bulk density gradient such that the bulk density at the face surface is at least 50% greater than the bulk density at the back surface;

(d) a filtering gradient such that the fineness of filtration at the face surface is greater than the fineness of filtration at the back surface;

(e) a gas permeability of at least 3 CFM per square foot at a pressure drop of 0.5 inch of water; and

(f) a fineness of filtration such that the dynamic leakage is 7.0% or less.

4,257,792

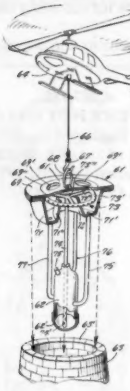
STEAM-PRESSURED SMOKE ELIMINATOR FOR TALL SMOKE STACKS

John J. Cremo, 104 Oak St., Portland, Me. 04104

Filed Aug. 3, 1979, Ser. No. 63,439

Int. Cl.³ B01D *47/08*; F23J *15/00*

U.S. Cl. 55—230 **4 Claims**



1. A self-contained, steam-pressured smoke eliminator adapted to be lowered as a unit by a helicopter into the top opening of a tall industrial-type smoke stack comprising a tapered vessel member releasably engageable with the stack wall for the support of the eliminator in the smoke stack, said tapered vessel member having a bottom wall with an enlarged central opening and an upwardly-extending peripheral flaring thereabout upwardly through which the smoke from the stack is passed, a baffle and cover member spaced above the peripheral flaring and connected to the tapered vessel member to laterally deflect the smoke leaving the top of upwardly-extending peripheral flaring, a steam generator unit supported from one of said members and adapted to depend into the smoke stack to be heated by the hot gases ascending the stack, a steam spray head member connected to one of the members and connected to the steam generator to direct steam into the deflected path of the smoke from the vessel opening and its flaring and into space overlying the wall of the tapered vessel member and drain means extending from the bottom of the tapered vessel for draining off the smoke condensate collected therein and one of said members having an opening for the exit of the cleaned smoke to the atmosphere.

4,257,793

APPARATUS FOR REMOVING MIST OR THE LIKE FROM A GAS FLOW

Makoto Kimishima, Tokyo, and Naoharu Shinoda, Hiroshima, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1979, Ser. No. 54,568

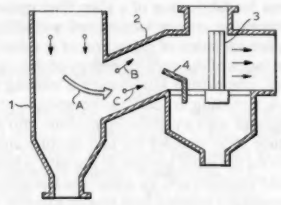
Claims priority, application Japan, Jul. 11, 1978, 53-95302[U]

Int. Cl.³ B01D *45/16, 45/08*

U.S. Cl. 55—394 **4 Claims**

1. An apparatus for removing mist and the like from a gas flow, comprising a main duct and a lateral duct connected to the downstream end of said main duct extending in a direction

different from that of said main duct for causing mist and the like in flowing gas introduced into the lateral duct from said main duct to deviate within the lateral duct toward the outer wall of the lateral duct extending from the radially outer part of the bend between the main duct and the lateral duct, a remover plate in said lateral duct on at least the outer wall of said lateral duct downstream of the bend between said main duct and said lateral duct at a position where a large portion of



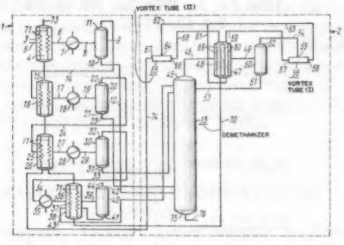
the mist and the like contained in the gas flow has moved close to the outer wall of the lateral duct for diverting the mist and the like out of the gas flow, said remover plate extending from the outer wall in a direction transversely of the lateral duct to the position where the flow of speed of the gas flow falls to about ½ of the highest flow speed in the flow speed distribution in a cross-section of the lateral duct at the position of said remover plate, and a mist eliminator in said lateral duct downstream of said remover plate.

4,257,794

METHOD OF AND APPARATUS FOR SEPARATING A GASEOUS HYDROCARBON MIXTURE

Vasily I. Shirokov, ulitsa S. Kovalevskoi, 10/4, kv. 105, Leningrad; Gennady G. Maljutin, ulitsa Kirova, 4, kv. 2, Novopolotsk; Ilyasaf I. Mishiev, 19 kvartal, 11, kv. 1, Sumgait; Nikolai N. Koshkin, Oktyabrskaya naberezhnaya, 100, korpus 3, kv. 11, Leningrad; Farida S. Abdullaeva, Vitebsky prospekt, 55, kv. 141, Leningrad; Anatoly K. Stukalenko, Grazhdanskaya ulitsa, 27, kv. 21, Leningrad; Alexandr N. Novichkov, ulitsa Sedova, 59, kv. 37, Leningrad, and Jury V. Saveliev, ulitsa Pionerskaya, 18, kv. 10, Baku, all of U.S.S.R.

Filed Jul. 20, 1979, Ser. No. 59,381
Int. Cl.³ F25J *3/02*
U.S. Cl. 62—28 **2 Claims**



1. A process for separating the olefins from a pressurized gaseous hydrocarbon feed mixture including essentially hydrogen, methane and olefins which comprise the steps of:

cooling said hydrocarbon mixture by sequential stages to temperature levels to form a liquid condensate of the olefins, and a portion of the methane with some hydrogen;

separating at each cooling stage, the liquid condensate from the gaseous residue;

demethanizing the liquid condensate from each cooling stage to separate the pure olefins from the formed residual gaseous mixture of hydrogen, methane and ethylene traces;

cooling the gaseous hydrogen-methane-ethylene mixture from demethanization;

separating a liquid condensate from said cooled mixture for use as a spray in the demethanization step;

introducing the cooled gaseous residue from the cooled hydrogen-methane-ethylene mixture into a first vortex effect tube to form upon expansion therein a hot gaseous steam and a cold gaseous stream;

cooling, with said cold stream, the gaseous hydrogen-methane-ethylene mixture from the demethanization step;

mixing said hot and cold gas streams to form a gaseous mixture;

introducing said gaseous mixture into a second vortex effect tube to form a further cold gaseous stream and a further hot gaseous stream;

introducing said further hot gaseous stream in counter-current heat exchange relationship to said gaseous hydrocarbon feed;

cooling with said further cold stream first the hydrogen-methane-ethylene mixture from demethanization and then the gaseous hydrocarbon feed;

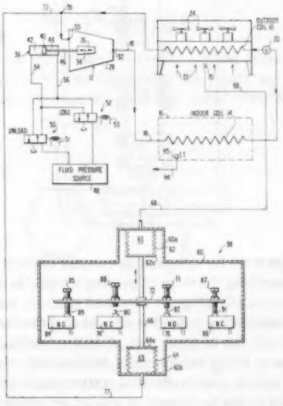
collecting the liquid olefins from said demethanization step and venting the hydrogen-methane mixture with reduced ethylene content from the process.

4,257,795

COMPRESSOR HEAT PUMP SYSTEM WITH MAXIMUM AND MINIMUM EVAPORATOR ΔT CONTROL

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Apr. 6, 1978, Ser. No. 893,863
Int. Cl.³ F25D *21/00*; F25B *41/00, 1/00*
U.S. Cl. 62—150 **10 Claims**



1. In an air source heat pump system of the type including a first heat exchanger forming an indoor coil, a second heat exchanger forming an outdoor coil and positioned in an ambient air flow, a compressor, and conduit means carrying a refrigerant and connecting said compressor between said coils and in a closed series loop, an expansion means provided within the conduit means adjacent to the inlet end of the outdoor coil to permit the outdoor coil to act as an evaporator when the system is in the heating mode, and wherein means are provided for loading and unloading the compressor to vary the capacity of the compressor and the system compression ratio, the improvement comprising:

(a) temperature sensing means positioned adjacent the outdoor coil and within the ambient air flow passing over the outdoor coil;

(b) means for sensing the evaporating temperature of the refrigerant available to the compressor from the outdoor coil; and

(c) control means operatively connected to said sensing means and responsive to a predetermined temperature decrease of evaporating temperature below ambient temperature for at least preventing further loading of the compressor, thereby tending to prevent the outdoor coil surface temperature from dropping below the dew point and virtually eliminating frosting of said outdoor coil.

4,257,796
CRYSTALLIZATION COLUMN

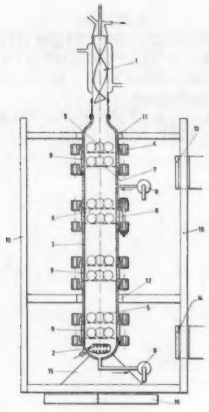
Gerardus J. Arkenbout, Zeist, Netherlands, assignor to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Continuation-in-part of Ser. No. 606,341, Aug. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 194,945, Nov. 2, 1971, abandoned. This application Feb. 14, 1977, Ser. No. 768,145

Claims priority, application Netherlands, Nov. 13, 1970, 7016632

Int. Cl.³ B01D *9/02*

U.S. Cl. 62—538 **7 Claims**



1. In the process for continuous counter current liquid-solids contact comprising the steps of passing a liquid in one direction through a vertically-alligned confined space in contact with a crystalline solid being passed in the other direction, said liquid being a solvent for at least part of said crystalline solid, said confined space being substantially horizontally restricted in a plurality of places, said horizontal restrictions being a plurality of perforated plates positioned at spaced intervals in said vertically aligned confined space-forming compartments, said restrictions being such that the said crystalline solids to be treated in counter current with said liquid substantially pass through said perforated plates, the improvement consisting of providing a pulsating or drumming action against said perforated plates by means of movable objects being substantially vertically vibrated against said perforated plates at a frequency of between 100 and 10,000 vibrations per minute with amplitudes of between 0.1 and 5 millimeters, whereby the passage of said crystalline solids through the perforations of said perforated plates is substantially promoted, said substantially vertical vibrations of said movable objects being effected by motion of said perforated plates in a vertical oscillation at such a rate that said movable objects are subjected to accelerating forces of about 2 to 5 times the gravitational force.

4,257,797
OPTICAL FIBER FABRICATION PROCESS

Matthew J. Andrejco, Wrightstown, and John B. MacChesney, Lebanon, both of N.J., assignors to Western Electric, New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 1,379, Jan. 5, 1979, abandoned. This application Oct. 1, 1979, Ser. No. 80,482

Int. Cl.³ C03C *25/02*; C03B *37/02*

U.S. Cl. 65—3 A **10 Claims**

1. A process for fabrication of a glass fiber optical transmission line, comprising, a core section and a cladding, wherein the cladding has an index of refraction of a value lower than the maximum index of the core for energy of the wavelength to be transmitted, comprising introducing a moving stream of a vapor mixture including at least one compound glass-forming precursor together with an oxidizing medium into a tube while heating the tube so as to react the said mixture and produce a glassy deposit on the inner surface of the tube wherein heating of the tube and contents are, by a moving hot zone, produced by a correspondingly moving heat source external to the tube, wherein combustion within the tube is avoided, and wherein the temperature within the hot zone, composition of the vapor mixture, and rate of introduction of the vapor mixture are maintained at values such that at least a part of the reaction takes place within the gaseous mixture at a position spaced from the inner walls of the said tube thereby producing a suspension of oxidic reaction product particulate material whereby the particulate material while travelling downstream comes to rest on the inner surface of the tube within a region which extends from a position within the said hot zone, the moving zone serving the dual functions of nucleation site for homogeneous reaction to produce particulate matter and consolidation site for previously produced particulate matter, thereby yielding an intermediate preform structure;

the invention characterized in that the core-to-clad ratio of the intermediate preform structure is greater than that of the ultimate fiber, and in that additional glass material is formed subsequently on the outside of the intermediate preform structure to yield an optical fiber preform.

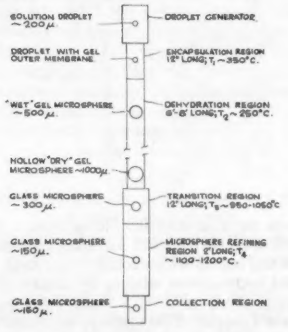
4,257,798
METHOD FOR INTRODUCTION OF GASES INTO MICROSPHERES

Charles D. Hendricks, Livermore; Jackson C. Koo, San Ramon, and Allan Rosencwaig, Danville, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 26, 1979, Ser. No. 61,166

Int. Cl.³ C03C *3/04*

U.S. Cl. 65—21.4 **9 Claims**


SOLUTION DROPLET ~200μ
DROPLET GENERATOR
DROPLET WITH GEL OUTER MEMBRANE
ENCAPSULATION REGION 12" LONG; T₁ ~ 350°C.
"WET" GEL MICROSPHERE ~500μ
DEHYDRATION REGION 6'-8' LONG; T₂ ~ 250°C.
HOLLOW "DRY" GEL MICROSPHERE ~1000μ
GLASS MICROSPHERE ~300μ
TRANSITION REGION 12" LONG; T₃ ~ 950-1050°C
GLASS MICROSPHERE ~150μ
MICROSPHERE REFINING REGION 5' LONG; T₄ ~ 1100-1200°C.
GLASS MICROSPHERE ~150μ
COLLECTION REGION

1. A method of filling a hollow glass microsphere with at least one gaseous material during formation of the microsphere comprising the steps of:

forming a thin hollow gel membrane from a solution of glass forming material;

filling an environment around the gel membrane with a gaseous material capable of diffusing into the membrane and selected from the group consisting of Ar, Kr, Xe, N_2, CO_2, Br, Ne, He, H_2, D_2, Dt and combinations thereof, so that the gaseous material diffuses into the thin hollow gel membrane during forming thereof; and

rapidly collapsing the gel membrane to form a hollow glass microsphere trapping the gaseous material in the microsphere.

4,257,799

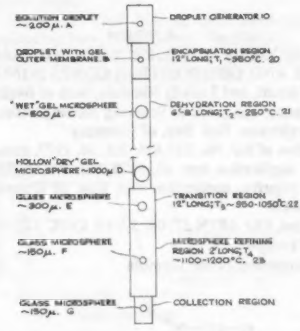
METHOD FOR PRODUCING SMALL HOLLOW SPHERES

Allen Rosencwaig, Danville; Jackson C. Koo, San Ramon, both of Calif., and John L. Dressler, Spring Valley, Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 26, 1979, Ser. No. 61,167

Int. Cl.³ C03B *3/04*

U.S. Cl. 65—21.4 **14 Claims**


SOLUTION DROPLET ~200 μ. A
DROPLET GENERATOR 10
DROPLET WITH GEL OUTER MEMBRANE B
ENCAPSULATION REGION 12" LONG; T1 ~ 960°C. 20
"WET" GEL MICROSPHERE ~800 μ. C
DEHYDRATION REGION 9"-18" LONG; T2 ~ 250°C. 21
HOLLOW "DRY" GEL MICROSPHERE ~100μ D
GLASS MICROSPHERE ~300 μ. E
TRANSITION REGION 12" LONG; T3 ~ 950-1050°C. 22
GLASS MICROSPHERE ~150μ. F
MICROSPHERE REFINING REGION 2" LONG; T4 ~1100-1200°C. 23
GLASS MICROSPHERE ~150μ. G
COLLECTION REGION

1. In a method for producing hollow glass spheres having a diameter in the range of about 100μ to about 500μ and a substantially uniform wall thickness in the range of about 0.5μ to about 20μ; the improvement comprising the steps of: forming droplets from a solution of silicate glass-forming materials; passing at least a portion of the thus formed droplets through a vertical furnace having at least three sequential temperature regions therein of about 200°–400° C., about 900°–1200° C., and about 1100°–1500° C., respectively; controlling the temperature of the regions of the furnace such that a second region has a tempeature of at least three times higher than the temperature of a preceding region and a sharp temperature gradient between the second region and the preceding region of the furnace, and controlling the transit rate of the forming hollow glass spheres through at least the second region.

4,257,800

DECORATIVE AIR BUBBLE FORMATION IN GLASSWARE

Katsundo Hasegawa, Yachiyo, Japan, assignor to Owens-Illinois, Inc., Toledo, Ohio

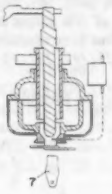
Filed Jul. 19, 1979, Ser. No. 58,637

Claims priority, application Japan, Jul. 26, 1978, 53-102687[U]

Int. Cl.³ C03B *7/08*

U.S. Cl. 65—221 **2 Claims**

1. An apparatus for forming a gob of molten glass and injecting a decorative air bubble in the gob as it is being formed, said apparatus comprising a gob feeder having a molten glass reservoir with an orifice in the bottom thereof, an elongated vertically disposed reciprocal plunger having a tip extending adjacent to said orifice, means for reciprocating said plunger, at least one air supply tube extending from the side of said reservoir into the molten glass in said orifice at a level below the lowest point of travel of the plunger tip and means for supplying a preset amount of pressurized air to said tube at intervals in synchronism with the reciprocal movements of said plunger so as to form at least one bubble in said molten glass.



4,257,801

COTTON DESICCATION WITH PHENOXYALKANOIC ACIDS

John E. D. Barton, Wokingham; Donald W. R. Headford, Reading, and David J. Collins, Crowthorne, all of England, assignors to Imperial Chemical Industries Limited, London, England

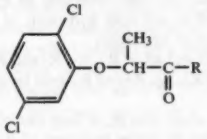
Continuation of Ser. No. 881,065, Feb. 24, 1978, abandoned. This application Sep. 20, 1979, Ser. No. 77,339

Claims priority, application United Kingdom, Mar. 9, 1977, 9878/77

Int. Cl.³ A01N *37/40*

U.S. Cl. 71—70 **5 Claims**

1. A process of desiccating growing cotton plants, which comprises applying to the foliage of the plants an effective amount of a phenoxypropionic acid derivative of the following formula (I):



wherein R is an —OH group; an OM group wherein M is an alkali metal, alkaline earth metal, ammonium or mono-, di-, tri- or tetra-(C_{1-6} alkyl) substituted ammonium cation; a phenoxy group optionally substituted by one or more halogen atoms or C_{1-4} alkyl groups; a cyclohexyloxy group; a C_{1-12} alkoxy group optionally substituted by one or more chlorine atoms, hydroxy groups, C_{1-4} alkoxy groups, alpha(2,5-dichlorophenoxy)propionyloxy, dialkylamino or phenyl groups optionally substituted by one or more chlorine atoms, phenoxy groups, or methyl groups; a C_{3-12} alkenyloxy group; a C_{1-12} alkylthio group optionally substituted by one or more phenyl groups which are unsubstituted or substituted by methyl or chlorine; a C_{3-12} alkenylthio group; or a group $-NR^1R^2$ wherein R^1 represents a hydrogen atom, a C_{1-4} alkoxy radical, a C_{1-4} alkyl radical, an allyl radical, a but-2-enyl radical, a phenyl radical, a mono(C_{1-4}alkyl)amino radical, or a di(C_{1-4}alkyl)amino radical; and R^2 represents a hydrogen atom, a C_{1-4} alkyl radical, an allyl or a but-2-enyl radical; or R^1 and R^2, together with the nitrogen atom to which they are attached, form a pyrrolidine or piperidine ring.

4,257,802

HERBICIDAL SULFONAMIDES

George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

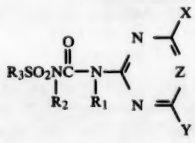
Filed Oct. 6, 1977, Ser. No. 840,167

The portion of the term of this patent subsequent to Nov. 28, 1995, has been disclaimed.

Int. Cl.[3] C07D *251/42, 251/46;* A01N *43/46*

U.S. Cl. 71—93 30 Claims

1. A compound having the formula:



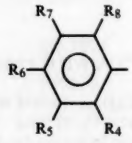
(I)

wherein

R_1 is H, alkyl of one to three carbon atoms or —OCH_3;

R_2 is H or alkyl of one to three carbon atoms;

R_3 is



R_4 and R_7 are independently hydrogen, fluorine, chlorine, bromine, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, nitro, CF_3, CH_3S— or CH_3CH_2S—;

R_5, R_6 and R_8 are independently hydrogen, fluorine, chlorine, bromine or methyl;

X is Cl, CH_3, —CH_2CH_3, alkoxy of one to three carbons, CF_3, CH_3S—, CH_3OCH_2— or $CH_3OCH_2CH_2O$—;

Y is CH_3 or OCH_3;

Z is N;

and their agriculturally suitable salts; provided that:

(a) R_1 and R_2 may not simultaneously be hydrogen; and

(b) when R_4 and R_8 are both hydrogen, at least one of R_5, R_6 or R_7 must be hydrogen;

(c) when R_6 is H and all or R_4, R_5, R_7 and R_8 are other than H, then all of R_4, R_5, R_7 and R_8 must be either Cl or CH_3; and

(d) when R_6 is other than H, at least one of R_4, R_5, R_7 and R_8 is other than H and at least two of R_4, R_5, R_7 and R_8 must be hydrogen.

2. A compound of claim 1 wherein

R_1 and R_2 are independently H or CH_3;

X is CH_3, CH_3CH_2— or alkoxy of one to three carbons; and

Y is CH_3 or OCH_3.

4,257,803

DIURETHANES AND METHODS FOR THEIR USE IN HERBICIDAL COMPOSITIONS

Friedrich Arndt, and Gerhard Boroschewski, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

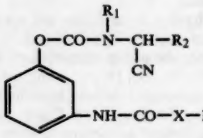
Filed Oct. 3, 1979, Ser. No. 81,320

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843691

Int. Cl.[3] C07C *121/50, 155/02*

U.S. Cl. 71—100 110 Claims

1. A compound of the formula



in which

R_1 is hydrogen, C_1–C_4 alkyl or C_2–C_4 alkenyl;

R_2 is phenyl, methylphenyl, methoxyphenyl, chlorophenyl, dichlorophenyl, cyclohexyl, benzyl or phenylethyl;

R_3 is C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkinyl, chloro-C_1–C_4 alkyl, chloro-C_2–C_4 alkenyl or chloro-C_2–C_4 alkinyl; and

X is oxygen or sulfur.

109. A selective herbicidal composition comprising an effective amount of at least one compound as defined in claim 1 as active agent in admixture with a carrier material.

4,257,804

CARBAMIC ACID ESTER, PROCESS FOR MAKING THE SAME AND COMPOSITION CONTAINING SAME

Friedrich Arndt, and Ludwig Nüsslein, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

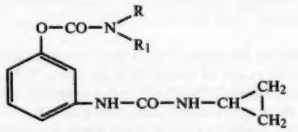
Continuation of Ser. No. 819,414, Jul. 26, 1977, abandoned. This application Apr. 10, 1979, Ser. No. 28,928

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 2634455

Int. Cl.[3] A01N *37/00, 37/44;* C07C *125/067*

U.S. Cl. 71—106 27 Claims

1. A compound of the formula



wherein R and R_1 are the same or different and are selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkinyl of 2 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl optionally substituted in one or two places by halogen, trifluoromethyl, nitro, alkoxy of one to 3 carbon atoms or alkyl of one to 3 carbon atoms, and naphthyl.

26. A herbicidal composition comprising about 10 to 80% by weight of at least one active agent as defined in claim 1 and the remainder a liquid or solid carrier material.

27. The composition of claim 26 which additionally includes up to 20% by weight of surface active agents.

4,257,805

HERBICIDAL (4-SUBSTITUTED-PHENYLAMINO)-3-(TRIFLUOROMETHYL)PHENYL)UREAS

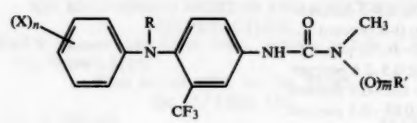
Kurt H. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 19,376, Mar. 12, 1979, abandoned. This application Jan. 10, 1980, Ser. No. 110,972

Int. Cl.[3] A01N *47/30;* C07C *127/15*

U.S. Cl. 71—120 3 Claims

1. A compound of the formula:



(I)

wherein R and R' each is hydrogen or alkyl of from one to three carbon atoms; m is zero or one, with the proviso that when m is 1, R' is not hydrogen; X is halogen, trifluoromethyl, or alkyl or alkoxy of from one to three carbon atoms, and n is one or two, with the priviso that no more than one of X is trifluoromethyl.

4,257,806

FIRED IRON-ORE PELLETS HAVING MACRO PORES AND PROCESS FOR PRODUCING THE SAME

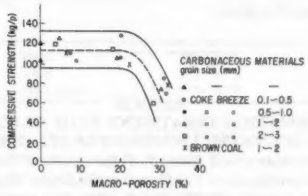
Isao Fujita, Kobe; Mamoru Onoda, Midorigaokahigashi; Fumikazu Kawaguchi, Kobe; Yoshimichi Takenaka, Kobe, and Tadao Tsutaya, Kobe, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Division of Ser. No. 774,067, Mar. 3, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 959,241

Claims priority, application Japan, Mar. 3, 1976, 51-23647

Int. Cl.³ C21B *5/00*; C22B *1/14*

U.S. Cl. 75—3 **2 Claims**



1. A process for the production of pig iron from hematite ore which comprises:

crushing the hematite ore such that 60–95% of said hematite ore has a particle size up to 44μ;

forming an admixture, to be pelletized, by the process which consists of admixing up to 4% by wt. of a carbonaceous material having a grain size of from 0.1 to 3 mm in diameter with the crushed hematite ore and admixing said crushed hematite ore and said carbonaceous material with from 3 to 9% by wt. of dolomite and admixing limestone with said crushed hematite ore, said carbonaceous material and said dolomite in an amount so as to adjust the CaO/SiO_2 ratio to about 1.2;

pelletizing the admixture thus prepared;

firing the resulting pellets; and

introducing said fired pellets into a blast furnace; wherein the quantity of said carbonaceous material admixed with said crushed ore is sufficient to provide said fired pellets with from 5 to 25% macro-pores relative to all of the pores in said fired pellets.

2. A process for producing fired iron-ore pellets containing macro-pores ranging from 0.1 to 3 mm in diameter dispersed throughout each of said pellets at a ratio of from 5 to 25% relative to all of the pores contained in each pellet which comprises:

crushing iron-ore such that 60–95% is in a range up to 44μ;

forming an admixture, to be pelletized, by the process which comprises admixing up to 4% by weight of a carbonaceous material having a grain size of from 0.1 to 3 mm in diameter with the crushed iron-ore and admixing said crushed iron-ore and said carbonaceous material with a flux containing MgO in an amount such that the MgO is present in an amount of up to 3% by weight and admixing said crushed iron-ore, said carbonaceous material and said flux with limestone in an amount so as to adjust the CaO/SiO_2 ratio to about 1.2;

pelletizing the mixture thus prepared; and

firing the resulting pellets.

4,257,807

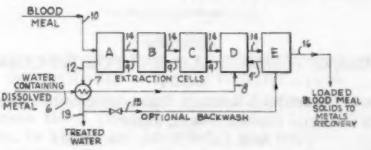
PRECIOUS METALS RECOVERY PROCESS

Walter Drobot, Montclair, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Feb. 12, 1980, Ser. No. 120,799

Int. Cl.³ C22B *11/04*

U.S. Cl. 75—108 **10 Claims**



1. A process for recovering metal from an aqueous medium containing the metal in solution, which comprises contacting the aqueous medium with blood meal for a period of time sufficient to convert dissolved metal to a water-insoluble form, and separating the resulting loaded blood meal containing removed metal from the resulting treated aqueous medium.

4,257,808

LOW MN ALLOY STEEL FOR CRYOGENIC SERVICE AND METHOD OF PREPARATION

John W. Morris, Jr., Berkeley, Calif., and Masakazu Niikura, Yokohama, Japan, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 13, 1979, Ser. No. 66,106

Int. Cl.³ C22C *38/04*; C21D *6/00*

U.S. Cl. 75—123 N **8 Claims**

1. A cryogenic alloy steel having a composition which is essentially free of nickel consisting essentially of about 4–6% manganese, about 0.02–0.06% carbon, 0.1–0.4% molybdenum, and the balance iron and incidental impurities associated therewith, said steel being characterized by a ductile-brittle transition temperature below −196° C. and a Charpy V-notch impact energy value greater than about 67 joules at −196° C.

4,257,809

MOLYBDENUM MONOCARBIDE-TUNGSTEN MONOCARBIDE SOLID SOLUTIONS

Stephen J. Burden, Troy, Mich., assignor to General Electric Company, Detroit, Mich.

Filed Jan. 5, 1979, Ser. No. 1,185

Int. Cl.³ B22F *1/00*; C22C *29/00*

U.S. Cl. 75—203 **14 Claims**

1. A process for forming a WC-MoC solid solution alloy comprising the steps of:

(a) intensely milling Mo and W metal powders;

(b) applying a homogenization heat treatment in the range of approximately 1000° to 1500° C. to said milled Mo and W metal powders thus forming a Mo-W solid solution alloy;

(c) crushing the Mo-W solid solution alloy to a fine powder;

(d) mixing the crushed Mo-W solid solution alloy powder with the stoichiometric amount of carbon of the carbide to be formed; and

(e) heating the mixture of step (d) at approximately 1100° to 1450° C. to form the desired WC-Mo C. alloy.

13. A process for forming a MC-Mo C solid solution alloy comprising the steps of:

(a) intensely dry attritor milling of Mo and W metal powders;
(b) applying a homogenization heat treatment of approximately 1450° C. to said milled Mo and W metal powders thus forming a Mo-W solid solution alloy;
(c) crushing the Mo-W solid solution alloy to a fine powder of about −35 mesh;
(d) thoroughly mixing by attritor milling, the crushed Mo-W solid solution alloy powder with the stoichiometric amount of carbon of the carbide to be formed and 0.5 to 1.0 weight percent of a metal selected from the group consisting of iron, cobalt and nickel; and
(e) heating the mixture of step (d) at a temperature in the range of approximately 1200° to 1300° C. to form the desired WC-Mo C alloy.

4,257,810
CORDIERITE, SILICA, ALUMINA POROUS CERAMIC BODY

Tsuneaki Narumiya, Yokohama, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 13, 1979, Ser. No. 66,116
Claims priority, application Japan, Aug. 12, 1978, 53-98448; Feb. 19, 1979, 54-18084
Int. Cl.³ C04B *21/00, 35/04, 35/10, 35/14*
U.S. Cl. 106—41 **4 Claims**

1. A ceramic porous body useful as a filtering material for molten metal and having a three-dimensional network cellular structure with a plurality of interconnected voids without clogging in any direction, which consists essentially of a cordierite phase, silica and alumina, characterized by having a pore size of 25–35 pores per linear centimeter in an area cut at optional positions, a bulk specific gravity of 0.3–0.7, a porosity of 75–90%, and a pressure loss of 4.8–30.0 mm as a water-gauge pressure when passing air through said body at 1 cm thickness at a rate of 1 m/sec.

4,257,811
SOLARIZATION AND IRRADIATION RESISTANT OPTICAL GLASSES

Walter Jahn, Ingelheim, Fed. Rep. of Germany, assignor to JENAer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Filed Jul. 23, 1979, Ser. No. 59,594
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832066
Int. Cl.³ C03C *3/10*
U.S. Cl. 106—47 Q **1 Claim**

1. Optical glasses having optical values of n_d about 1.51 and v_d about 58, a density of about 2.46g/cm³ and being characterized by good light transmission, low susceptibility to crystallization, good chemical stability (class 1 climate change stability, class 2 acid stability, class 0 spot value), very minor formation of color centers during irradiation, electrical conductivity of about $10^{-10} \times cm^{-1}$, a thermal expansion coefficient at −30 to +70° C. of about 88×10^{-7}° C. and good workability, said glasses being substantially free of alkaline earth metal oxides and consisting essentially of the following composition, in percent by weight:

SiO_2: 68–75 percent
Al_2O_3: 4.5–8 percent
B_2O_3: 0–4 percent
Na_2O: 16–22 percent
CeO_2: 0.5–2.8 percent
ZnO: 0.05–0.8 percent
SrO: 0.05 –0.8 percent

4,257,812
FIBROUS REFRACTORY PRODUCTS

Thomas A. Johnson, and William G. Long, both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, Del.

Filed Jan. 17, 1979, Ser. No. 4,103
Int. Cl.³ C04B *33/00, 35/82*
U.S. Cl. 106—67 **1 Claim**

1. A fibrous refractory product for handling molten aluminum, free from asbestos, and being chemically inert to molten aluminum and its alloys prepared by the process of mixing the ingredients consisting essentially of
(a) 30 to 80 weight percent of aluminosilicate fiber; and
(b) 20 to 70 weight percent of kaolin clay; adding water, shaping the mix, and drying said shaped form at a temperature of less than 200° F. to remove mechanical water and form an unfired part, machining the unfired part, and firing the machined part at an elevated temperature of about 1,500° F. to transform the clay into the amorphous metakaolin phase.

4,257,813
FORMATION TREATMENT WITH SILICATE ACTIVATED LIGNOSULFONATE GEL

Dan D. Lawrence, and Betty J. Felber, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 939,579, Sep. 5, 1978. This application Apr. 27, 1979, Ser. No. 33,916
Int. Cl.³ E21B *33/138;* **C08L** *97/00*
U.S. Cl. 106—74 **7 Claims**

1. An aqueous fluid containing gel-forming amounts of water-soluble lignosulfonate and water-soluble silicate, wherein the weight ratio of SiO_2 to lignosulfonate is about 0.2:1 to about 1:1.

4,257,814
ACCELERATING AGENTS FOR ACCELERATING HARDENING OF CEMENT

William H. Kellet, Coalville, and Peter S. Mills, Burton-on-Trent, both of England, assignors to Coal Industry (Patents) Limited, London, England

Division of Ser. No. 903,804, May 8, 1978, abandoned. This application Jun. 26, 1979, Ser. No. 52,142
Claims priority, application United Kingdom, May 10, 1977, 19554/77; Aug. 9, 1977, 33327/77
Int. Cl.³ C04B *7/02*
U.S. Cl. 106—90 **7 Claims**

1. A method of at least partially filling a cavity in an underground mine which method comprises the steps of
(a) where required, defining said cavity using shuttering,
(b) charging to said cavity a first aqueous slurry containing a hydraulic cement and concurrently charging and mixing with said first aqueous slurry a second aqueous slurry containing an agent for accelerating hardening of the hydraulic cement and
(c) permitting the mixed slurries to harden into a supportive concrete-like material in the cavity.

4,257,815
AIR ENTRAINING MORTAR AND PROCESS OF MANUFACTURE

Karl V. Hauser, Ann Arbor, Mich., assignor to Edw. C. Levy Co., Detroit, Mich.

Filed Jul. 13, 1979, Ser. No. 57,345
Int. Cl.[3] C04B 7/02
U.S. Cl. 106—98 18 Claims

1. A composition of matter comprising a mortar having at least fly ash containing carbon, cement, sand, water, an air entraining chemical admixture and a water soluble alkaline earth oxide in a quantity sufficient to inhibit the air adsorptive properties of the carbon in said fly ash and to retain air voids in said mortar.

4,257,816
NOVEL BLEND OF ALGIN, TKP, AND GUAR GUM

Robert I. Yin, La Jolla, and Jerry G. Lewis, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 17, 1979, Ser. No. 75,871
Int. Cl.[3] C08L 5/04
U.S. Cl. 106—208 19 Claims

1. A blend of algin, TKP, and guar gum wherein the weight percents are:

algin	5%–90%
TKP	5%–90%
guar gum	5%–90%

with the proviso that the ratio of algin:(TKP plus guar gum) on a weight-weight basis range from about 90:10 to about 5:95 and the TKP is selected from the group consisting of tamarind kernel powder, cold-water soluble tamarind kernel powder, tamarind polysaccharide, tamarind seed jellose, and the tamarind kernel constituents.

9. A non-pigmented paper coating composition consisting essentially of water, binder and algin:TKP:guar gum blend wherein the weight percents are:

algin	5%–90%
TKP	5%–90%
guar gum	5%–90%

with the proviso that the ratio of algin:(TKP plus guar gum) on a weight:weight basis range from about 90:10 to about 5:95 and the TKP is selected from the group consisting of tamarind kernel powder, cold-water soluble tamarind kernel powder, tamarind polysaccharide, tamarind seed jellose, and the tamarind kernel constituents.

14. A pigmented paper coating composition consisting essentially of water, pigment, binder and an algin:TKP:guar gum blend wherein the weight percents are:

algin	5%–90%
TKP	5%–90%
guar gum	5%–90%

with the proviso that the ratio of algin:(TKP plus guar gum) on a weight:weight basis range from about 90:10 to about 5:95 and the TKP is selected from the group consisting of tamarind kernel powder, cold-water soluble tamarind kernel powder, tamarind polysaccharide, tamarind seed jellose, and the tamarind kernel constituents.

4,257,817
METHOD OF REDUCING BINDER DEMAND OF INORGANIC FILLER

Krishna K. Mathur, and Olinda W. Rush, both of Easton, Pa., assignors to Pfizer Inc., New York, N.Y.

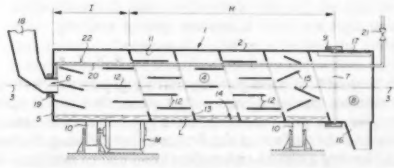
Continuation of Ser. No. 873,975, Jan. 31, 1978, abandoned. This application Oct. 11, 1979, Ser. No. 83,824
Int. Cl.[3] C08L 91/00; C09C 3/04
U.S. Cl. 106—266 8 Claims

1. A method for reducing the binder demand of particulate inorganic filler without substantially altering said filler's surface area, which comprises subjecting said filler alone to intense rotary impact agitation at a peripheral speed of from about 20 to 60 meters per second for a time sufficient to reduce said binder demand.

4,257,818
PROCESS AND APPARATUS FOR CONTINUOUS ACID HYDROLYSIS AND SACCHARIFICATION

Alain Regnault, Ornex; Jean-Pierre Sachetto, St-Julien-en-Genevois; Herve Tournier, Valleiry, all of France; Thomas Hamm, Le Lignon, and Jean-Michel Armanet, Onex, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Division of Ser. No. 892,329, Mar. 31, 1978, Pat. No. 4,199,371. This application Apr. 24, 1979, Ser. No. 32,891
Claims priority, application Switzerland, Apr. 1, 1977, 4120/77
Int. Cl.[3] B01J 19/08; B01F 9/02; C13K 1/02
U.S. Cl. 127—1 1 Claim



1. In a reactor for continuously hydrolyzing lignocellulosic materials by contact with highly concentrated hydrochloric acid in which the reactor includes a horizontal rotating drum having an internal tubular surface, an inlet end and an outlet end, means defining an impregnation zone adjacent to said inlet end for admitting and impregnating the materials with the acid and means defining a hydrolyzing zone for hydrolyzing said materials following the impregnation zone, means for rotating the drum, means for feeding lignocellulosic materials to the impregnation zone, spraying means in said impregnation zone for spraying acid into said impregnation zone and soak the materials and form a liquid acid bath in the bottom of the reactor, a plurality of longitudinally extending paddles that project radially inwardly from the drum's internal surface in the hydrolyzing zone for moving the materials through the acid bath in the bottom of the reactor, raising it out of the bath and thereafter dropping it back into the bath as the reactor rotates, and a helical propelling baffle having a plurality of turns mounted around the internal surface of the reactor and defining a helical channel for displacing the liquid bath in the bottom of the reactor from the impregnation zone through the hydrolyzing zone to said outlet end, and means for discharging the final product from said drum at said outlet end, the improvement comprising mounting the paddles in the helical channel defined by the helical baffle in the hydrolyzing zone of the reactor in staggered configuration with respect to the path of rotation of the reactor, one end of each of said paddles being in contact with the baffle while the opposite end is spaced from the baffle, with adjacent paddles having their opposite ends in contact with the baffle, whereby the acid bath in the bottom of the reactor will swing back and forth between the paddles as the paddles move through the bath in response to rotation of

the reactor, said paddles having a substantial length so that the materials and acid lifted out of the bath by the paddles will fall downwardly, first toward the outlet end and then toward the inlet end from paddle to paddle as the reactor rotates, said motion of the materials and acid resulting in a more intimate contact between them while effecting a scrubbing of the internal wall of the reactor drum.

4,257,819

METHOD FOR FLUSHING OUT A NARROW GAP

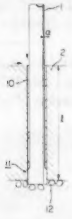
Kenji Abe, Hyogo; Ayao Tsuge; Yasuhiko Hirao, both of Kobe; Keiichi Hori, Hyogo, and Masamichi Isono, Himeji, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1979, Ser. No. 14,629

Claims priority, application Japan, Mar. 10, 1978, 53/27283

Int. Cl.³ B08B *3/10, 9/00*

U.S. Cl. 134—19 **2 Claims**



2. A method for flushing a very narrow gap formed between a first member having a bore with a closed end and a second member fixed in said bore to define a gap between the second member and the surface of the first member defining the bore, said gap having a closed end at the closed end of said bore and an open end where said bore opens out of said first member, said method comprising the steps of placing the open end of said gap in communication with a space filled with a flushing liquid, increasing the pressure of said flushing liquid, locally heating the closed end of said gap to a temperature which, when the pressure of the flushing liquid is subsequently reduced is sufficient to cause boiling of the flushing liquid, and then reducing the pressure of pressurized flushing liquid to cause boiling of the liquid within the gap for flushing the gap by causing some of the liquid to be flushed out of the gap and the liquid flushed out of the gap is replaced by flushing liquid, and while continuing to locally heat the closed end of said gap, repeating the steps of alternately increasing the pressure of and reducing the pressure of said flushing liquid, whereby the flushing efficiency is enhanced.

4,257,820

METHOD FOR REMOVING THE RUBBER LINING FROM A RUBBER-LINED VESSEL

Patrick D. Jacobs, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 13, 1979, Ser. No. 57,611

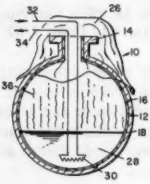
Int. Cl.³ B08B *5/00, 5/02, 9/00*

U.S. Cl. 134—22 R **5 Claims**

1. A method for loosening the rubber lining from interior walls of a vessel when said rubber lining is bonded to said walls by an adhesive, which method comprises:

a. substantially sealing the vessel off from fluid communication with the environment external to the vessel;

b. within the sealed vessel, at least partially vaporizing a solvent whose vapors are not only a solvent for the adhesive, but also are capable of penetrating the rubber lining so that it can substantially dissolve the agent bonding the rubber to the interior walls of the vessel for a time sufficient for the vaporized solvent to penetrate the rubber and substantially dissolve the bonding agent; and



c. injecting air between the vessel wall and the rubber lining through a small hole cut through the rubber lining following the vaporization of the solvent.

4,257,821

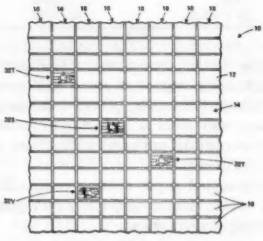
UNIVERSAL SOLAR CELL/CONDUCTOR JUNCTION ELEMENT AND SOLAR PANEL EMBODYING SAME

Franklin G. Kelly, Long Beach; Saul Bashin, Sepulveda, and Robert E. Kennedy, Lawndale, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Nov. 13, 1978, Ser. No. 960,318

Int. Cl.² H01L *31/04*

U.S. Cl. 136—244 **30 Claims**



1. A solar panel comprising:

a substrate,

an array of solar cells mounted on said substrate,

circuit means electrically connecting said solar cells to form a solar electric power generating network, and

said circuit means comprising interconnect means on said solar cells, lead wires, and a junction element mounted on said substrate within said cell array including an electrically insulating base member having an over-all size and shape approximately the size and shape of the individual solar cells whereby said junction element may occupy any solar cell position in said array, terminal means on said base member including a solar cell terminal electrically connected to interconnect means of a selected solar cell of said array and a wire terminal connected to a selected lead wire of said circuit means, and means on said base member electrically connecting said cell terminal and wire terminal.

2. The solar panel of claim 1 wherein:

said selected lead wire extends from said wire terminal to the rear side of said substrate through aligned holes in said substrate and base member.

3. The solar panel of claim 1 wherein:

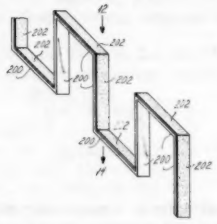
said solar cells and junction element base member have similar thin, flat, rectangular shapes.

4,257,822

CONTINUOUS THERMOPILE

Ernesto E. Gomez, Avianca Bldg., 3rd Floor 1612 Ponce de Leon Ave., Santurce, P.R. 00909

Filed Jan. 2, 1979, Ser. No. 201
Int. Cl.[3] H01L *35/00, 35/28*
U.S. Cl. 136—206 20 Claims



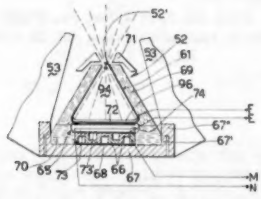
1. A current generator located in a temperature gradient between a heat source region and a heat sink region, said generator comprising a first continuous rigid material having thermoelectric characteristics and having a first portion extending between said source and sink and a second portion extending between said sink and source, and a second material having thermoelectric characteristics electrically connected with only one of said first or second portions of said first material, said first material serving as a rigid base for said current generator, said second material overlapping a portion of said first material, said current generator comprising a plurality of thermocouples formed of said first continuous material and said second material, connected at junctions with said junctions of said thermocouples formed where the second material overlaps the first material and is electrically joined thereto.

4,257,823

DIRECT CONVERSION SOLAR ELECTRIC GENERATOR

Silvio Bevilacqua, and Renato Gislon, both of Rome, Italy, assignors to Comitato Nazionale per l'Energia Nucleare-CNEN, Rome, Italy

Filed May 16, 1979, Ser. No. 39,368
Claims priority, application Italy, Jun. 2, 1978, 49677 A/78
Int. Cl.[3] H01T *35/00*
U.S. Cl. 136—206 17 Claims



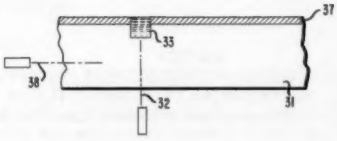
1. An apparatus for directly converting the solar radiation into electric power which generator comprises a plurality of optical systems mechanically assembled together and arranged at constant angular distance about a central axis, which are maintained constantly pointed towards the sun, which systems focalize the sun radiation into the inlet opening of a hollow body provided with a flat wall facing said opening, the remaining walls of the body being thermally insulated with respect to the body outside, said flat wall being in direct thermal contact with two converters of heat into electric power disposed in thermal cascade, the first converter being a thermoionic converter and the second converter being a thermoelectric converter, the cold end of the thermoelectric converter being in direct thermal contact with a heat draining or disposal system to the atmosphere which draining system comprises a heat conducting plate at thermal contact with said cold end of the thermoelectric converter and a plurality of metal sheets connected to said plate.

4,257,824

PHOTO-INDUCED TEMPERATURE GRADIENT ZONE MELTING

Kenneth A. Jackson, Plainfield; Lionel C. Kimerling, Westfield, and Harry J. Leamy, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 31, 1979, Ser. No. 62,350
Int. Cl.[3] H01L *21/275*
U.S. Cl. 148—1.5 19 Claims



1. A process comprising

maintaining a temperature gradient across a molten zone which exists within a body, the said body comprising a first material and the said molten zone comprising the first material and at least one second material, the said temperature gradient having associated with it a high temperature interface between the molten zone and the body, and a cool temperature interface between the molten zone and the body, the high temperature interface being at a temperature sufficiently high to progressively melt the body and the cool temperature interface being at a temperature sufficiently low so that material from the molten zone solidifies at the cool temperature interface, whereby the molten zone progresses through the body;

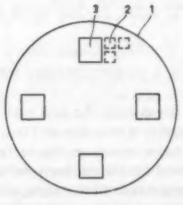
the invention CHARACTERIZED IN THAT the molten zone within the body is preferentially heated to establish the temperature gradient.

4,257,825

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES HAVING IMPROVEMENTS IN DEVICE RELIABILITY BY THERMALLY TREATING SELECTIVELY IMPLANTED TEST FIGURES IN WAFERS

Hanno Schaumburg, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 2, 1979, Ser. No. 63,314
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 2837776; Nov. 8, 1978, 2848331
Int. Cl.[3] H01L *21/26;* G01R *31/22;* H01L *17/00*
U.S. Cl. 148—1.5 8 Claims



1. A method of manufacturing semiconductor devices in

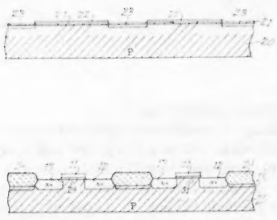
which at least one zone of a given conductivity type is provided in a number of semiconductor wafers comprising the steps of implanting doping ions into each semiconductor wafer to form at least one test figure, subjecting only said test figure to a thermal treatment by selectively directing an intensive radiation thereon, measuring electrical properties of said test figure, and carrying-out further thermal treatment of the entire semiconductor wafer as a result of said measuring step.

4,257,826

PHOTORESIST MASKING IN MANUFACTURE OF SEMICONDUCTOR DEVICE

Samuel Matalone, Jr., Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 11, 1979, Ser. No. 83,929
Int. Cl.³ H01L *21/26*
U.S. Cl. 148—1.5 **11 Claims**



8. A method of making a semiconductor device comprising the steps of applying a layer of photosensitive masking material on a face of a semiconductor body, exposing first areas of said layer to radiation, developing the layer to remove said first areas, altering said face at said first areas using the remaining layer as a mask by a processing operation, exposing second areas of the layer to radiation, developing the layer to remove the second areas, and altering said face at said second areas using the remaining layer as a mask by another processing operation.

4,257,827

HIGH EFFICIENCY GETTERING IN SILICON THROUGH LOCALIZED SUPERHEATED MELT FORMATION

Guenter H. Schwuttke, Poughkeepsie, and Kuei-Hsiung Yang, Wappingers Fall, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

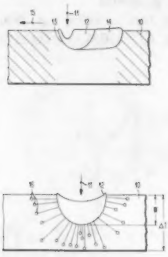
Filed Nov. 13, 1979, Ser. No. 93,485
Int. Cl.³ H01L *21/265*; B23K *27/00*
U.S. Cl. 148—1.5 **10 Claims**

1. A method for gettering contaminants, defects or the like to major surface of a monocrystalline semiconductor body comprising:

directing a laser beam onto the said surface of said body;

applying controlled power to the said laser beam in a manner that the laser beam increases the surface temperature to the melting point of the semiconductor material but below the boiling temperature of the semiconductor material;

scanning the said laser beam over said surface so that the solid-liquid interface moves deep into the semiconductor material forming a depression under the said laser beam while the material rises behind the said laser beam;



heating the said wafer at a temperature and for time sufficient to getter said contaminants to gettering centers.

4,257,828

NON-AQUEOUS COMPOSITION FOR CHEMICAL TREATMENT OF A METALLIC SUBSTRATE

Hideo Wada; Akiro Ushio, and Masaharu Koganei, all of Tokyo, Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed Jan. 18, 1980, Ser. No. 113,267
Claims priority, application Japan, Jan. 19, 1979, 54-5151
Int. Cl.³ C23F *7/10, 7/26*
U.S. Cl. 148—6.16 **9 Claims**

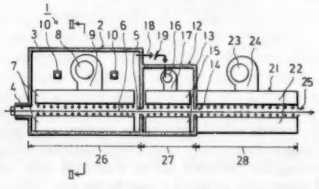
1. A substantially non-aqueous composition for chemical treatment of the surface of a metallic substrate, which comprises a chlorinated hydrocarbon solvent, chromic anhydride, phosphoric acid, a solubilizer which is per se soluble in the chlorinated hydrocarbon solvent, can solubilize the chromic anhydride and the phosphoric acid therein and a stabilizer which can prevent the decomposition of the chlorinated hydrocarbon solvent, inhibition of the reduction of the chromic anhydride or stabilization of the non-aqueous composition, and wherein the weight proportion of the chlorinated hydrocarbon solvent, chromic anhydride, phosphoric acid, the solubilizer and the stabilizer is 100:0.003–0.03:0.003–0.12:0.1–2:0.001–5.

4,257,829

METHOD FOR COOLING AN ALUMINUM STRIP DURING THE PROCESS OF HEAT TREATMENT

Hiromu Yoshimoto, Chita; Michitoshi Okumura, Kasugai, and Kenji Kawate, Nagoya, all of Japan, assignors to Daidotokushuko, Japan

Filed Jul. 9, 1979, Ser. No. 55,869
Claims priority, application Japan, Jul. 15, 1978, 53-86558
Int. Cl.³ C22F *1/04*
U.S. Cl. 148—13 **4 Claims**



1. A method for cooling an aluminium strip after heat treatment comprising the steps of:

(i) passing hot aluminium strip in floating mode through a first cooking zone in which the strip is cooled by a floating mode gas at a gradient not exceeding 110° C./m until the temperature of the strip has been lowered to 250° C., and

(ii) thereafter passing the strip in floating mode through a second cooling zone in which the strip is cooled by floating mode gas at a gradient exceeding 110° C./m to a temperature less than 250° C.

4,257,830

METHOD OF MANUFACTURING A THIN RIBBON OF MAGNETIC MATERIAL

Noboru Tsuya, 1-38, Kashiwagi 2-Chome, Sendai, Japan, and Kenichi Arai, Sendai, Japan, assignors to Noboru Tsuya, Sendai, Japan

Filed Dec. 29, 1978, Ser. No. 974,504

Claims priority, application Japan, Dec. 30, 1977, 52-158017; Sep. 19, 1978, 53-114846

Int. Cl.³ H01F *1/04*

U.S. Cl. 148—112 **20 Claims**

1. A method of manufacturing a thin ribbon of magnetic material having a high permeability and excellent flexibility and workability comprising the steps of:

melting a magnetic material consisting essentially of by weight of 4–7% of aluminum, 8–11% of silicon and the remainder iron and inevitable impurities of less than 0.5%, at a temperature between the melting point and a temperature not exceeding about 300° C. above the melting point;

ejecting the resultant melt through a nozzle under a pressure of from about 0.01 to 1.5 atm. onto a moving surface of a cooling substrate; and

cooling the melt on said moving surface of said cooling substrate at a cooling rate of from about 10^3 to 10^6° C./sec

to form a thin ribbon having a compact and fine grain size structure, wherein the fine crystal grain structure is essentially composed of columnar grains aligned perpendicular to the surface of the thin ribbon and having a mean grain diameter of from about 1 to 100 μm.

4,257,831

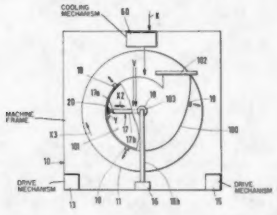
PROCESS FOR THE CONTINUOUS HARDENING OF PUMP CASINGS

Vinzenz Siller, Swartenhorst 3, 2000 Hamburg 71, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,968

Int. Cl.³ C21D *1/08, 9/08*

U.S. Cl. 148—134 **6 Claims**



1. A process for the continuous hardening of pump casings which during use have a vertical axis and the casing having an arcuately shaped inner area generally encircling the vertical axis in an eccentric manner, the inner area may have an internal plating and depending on the hardening being effected the core characteristics of the material forming the inner area may be changed, by flame hardening the inner surface of the inner area of the casing with a flame hardening burner including the steps of moving the pump casing relative to the flame hardening burner past the flame hardening burner with the relative movement being about the vertical axis, directing cooling water against the inner surface of the inner area after the exposure of the inner area to the flame hardening burner and simultaneously moving the pump casing for removing the cooling water from the pump casing by flowing the cooling water directed against the inner surface of the inner area over the inner surface already exposed to the flame hardening step.

5. A process for the continuous hardening of pump casings which during use have a vertical axis and the casing having an arcuately shaped inner area generally encircling the vertical axis in an eccentric manner, the inner area may have an internal plating and depending on the hardening being effect..d the core characteristics of the material forming the inner area may be changed, by flame hardening the inner surface of the inner area of the casing with a flame hardening burner including the steps of holding the pump casing in a stationary horizontal position on pump casing support means with the vertical axis thereof being positioned vertically and moving the flame hardening burner past the stationary inner surface of the inner area of the casing, directing cooling water against the inner surface of the inner area after the exposure of the inner area to the flame hardening burner and displacing the pump casing support means out of the horizontal position with the pump casing being held stationary relative to the pump casing support means for removing cooling water via the already hardened inner surfaces.

4,257,832

PROCESS FOR PRODUCING AN INTEGRATED MULTI-LAYER INSULATOR MEMORY CELL

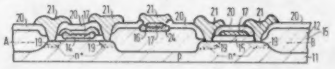
Ulrich Schwabe, Vaterstetten, and Erwin Jacobs, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 18, 1979, Ser. No. 58,555

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1978, 2832388

Int. Cl.³ H01L *21/22*

U.S. Cl. 148—187 **9 Claims**



1. A process for producing an integrated multi-insulator memory cell with a self-adjusting overlying polysilicon contact using silicon gate technology comprising applying a relatively thin SiO_2 layer having a thickness of about 1.5 to 12 nm onto the semiconductor substrate and applying an oxynitride layer of a composition ($Si_xO_yN_z$) wherein x, y and z are integers having a thickness of about 20 to 60 nm above said SiO_2 layer with said SiO_2 layer functioning as a tunnel oxide and said oxynitride layer functioning as a storage layer, and wherein a gate oxide layer having a thickness of about 50 to 100 nm is produced by a further oxidation of said substrate.

4,257,833

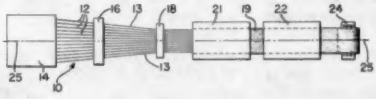
METHOD OF MANUFACTURE OF CABLE BELTS HAVING GENERALLY SYMMETRICALLY TENSIONED CABLES

Larry W. Jensen, Marysville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 19, 1979, Ser. No. 95,805

Int. Cl.³ B29S *17/00*; G01B *5/24*

U.S. Cl. 156—64 **6 Claims**



1. In the manufacture of a cable belt of the type including a plurality of parallel cables embedded in polymeric compound, said cables extending throughout the lengthwise direction of

the belt and being spaced apart from one another in the transverse direction of the belt, wherein the longitudinal centerline of said belt differs from the longitudinal centerline of the equipment on which it is to be produced, wherein the cables of said belt are tensioned by a tensioner positioned between a cable letoff and a spacing comb, wherein the spacing between adjacent cables of said belt is different at said tensioner from that at said comb, wherein the improvement comprises a method for reducing asymmetry of tension of the cables of said belt about the longitudinal centerline of said belt, comprising:

determining the proper edge of said belt,

determining the effective number of cables from the proper edge at said tensioner,

positioning said effective number of cables of said belt transversely at the comb such that they extend from tensioner positions nearest the proper edge to comb positions distributed substantially equally about the longitudinal centerline of said belt,

positioning one-half of the remaining cables of said belt transversely at the comb an effective number of spaces toward the proper edge.

4,257,834

PROCESS FOR PRODUCING A SHEET HAVING CHIP DESIGN

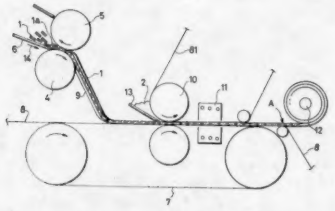
Kosuke Iida; Tadayuki Morikawa; Mitsuo Aoki; Isamu Ueda; Takashi Butsuda, and Osami Tsuda, all of Osaka, Japan, assignors to Takiron Co., Ltd., Osaka, Japan

Filed Apr. 5, 1979, Ser. No. 27,324

Claims priority, application Japan, Apr. 11, 1978, 53-42873

Int. Cl.³ B29J *5/00*; B32B *5/16*

U.S. Cl. 156—73.6 **23 Claims**



1. A process for producing a sheet having a chip-like pattern which comprises: feeding a plurality of chips while densely aligning the chips in a plane so that they do not overlap one another by means of a chip feed roll and an aligning roll, said aligning roll rotating in a direction opposite to the direction in which the chips are fed and said feed roll rotating in the same direction in which the chips are fed, said aligning roll and said feed roll being juxtaposed such that the clearance therebetween is slightly larger than the thickness of a chip; filling the interstices among the chips with a binder by a supply means capable of thickness adjustment such that the chips penetrate or substantially penetrate through the sheet in its thickness direction; and solidifying the binder so filled.

4,257,835

METHOD OF MANUFACTURE OF MATERIAL REINFORCED WITH A THREE-DIMENSIONAL TEXTILE STRUCTURE

Bruno Bompard, Lyons, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 30, 1979, Ser. No. 62,020

Claims priority, application France, Aug. 8, 1978, 78 23374

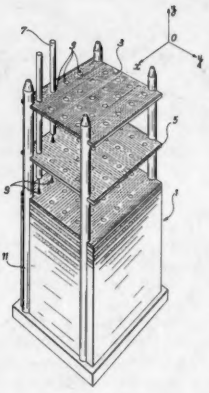
Int. Cl.³ B32B *7/08, 31/12, 31/26*

U.S. Cl. 156—92 **13 Claims**

1. A method of manufacture of material reinforced with a three-dimensional textile structure, wherein said method consists:

(a) in realizing densified layers of fibers,

(b) in forming a stack of layers from said fibers provided with holes and so arranged that the fibers of said layers extend within said stack in at least two directions designated as first and second directions which define the plane



of the layers and that said holes form within said stack passages which extend in a third direction, each passage having a given dimension,

(c) in implanting in said passages rods constituted by an assembly of densified fibers, said rods extending in the third direction,

(d) in increasing the density of the assembly thus obtained.

4,257,836

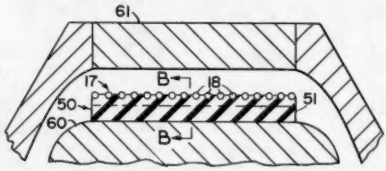
PNEUMATIC TIRE

Heinz W. Beneze, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jul. 30, 1979, Ser. No. 61,970

Int. Cl.³ B29H *17/00, 17/28*

U.S. Cl. 156—125 **10 Claims**



1. In the method of manufacturing a pneumatic tire comprising an annular road-engaging tread in the crown area, sidewalls connecting the lateral edges of said tread to annular beads, a cast body extending continuously from one bead to the other encompassing the sidewalls and the crown area radially inward of said tread, and a girdle member comprised of reinforcing cords embedded in said crown area of said cast body, the improvement comprising the steps of assembling the girdle member directly on the outer periphery of a rigid annular member with said cords having a cord centerline diameter substantially equal to the one desired in the finished tire, placing said annular member-girdle member assembly into a first mold with means to form a spacing support member on the outer periphery of said girdle member, injecting a viscoelastic material into said mold, curing said viscoelastic material to form a hoop assembly having the girdle member on its inner periphery and the spacing support member on its outer periphery, removing said hoop assembly from said mold, inverting said hoop assembly while maintaining the desired cord centerline diameter of girdle member cords whereby said girdle member is on the outer periphery and said spacing support

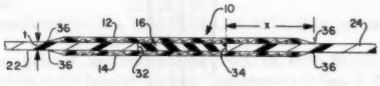
member is on the inner periphery, placing said inverted hoop assembly in a tire mold with said spacing support member supported by the outer periphery of an annular core mold member and said girdle member cords at the desired cord centerline diameter, filling said tire mold with a viscoelastic material to form a tire and curing said viscoelastic material to form a pneumatic tire.

4,257,837

SEAL SPLICE

George A. Lucas, Rockmart, Ga., assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Feb. 25, 1980, Ser. No. 124,415
Int. Cl.³ B32B *31/12, 3/02*
U.S. Cl. 156—153 **5 Claims**



1. A method of splicing ends of material forming an annular floating roof tank secondary seal comprising the steps of:
(a) providing a length of an integrally vulcanized splicing unit substantially matching the width of the seal material to be joined by splicing and an H-section configuration comprised of fabric reinforced elastomer forming the sides and reinforced elastomeric gum interposed between the sides and forming the central cross member of the H-section.
(b) buffing the ends of the seal material to roughen the exposed surfaces thereof in the area to be spliced and cleaning the roughened areas with a solvent to remove any foreign and loose material;
(c) applying multiple coats of an appropriate adhesive to the roughened areas;
(d) inserting the ends of the seal material into the open ends of the H-pattern of the splicing unit until the ends abutt the unreinforced gum;
(e) rolling the spliced area to remove any air bubbles; and
(f) curing the spliced seal.

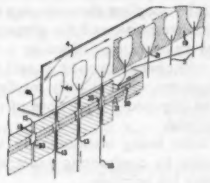
4,257,838

PROCESS AND APPARATUS FOR THE MANUFACTURE OF DISPOSABLE PHARMACEUTICAL SINGLE-DOSE CONTAINERS

Peter Asp, Biberach van der Riss; Dieter Jarsen, Laupheim; Heinrich Eggert, Biberach van der Riss, and Wilhelm Klingelhöller, Mettenberg,Bibrrach, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 901,683, May 1, 1978, abandoned, which is a continuation of Ser. No. 788,838, Apr. 19, 1977, abandoned, which is a continuation of Ser. No. 695,091, Jun. 11, 1976, abandoned, which is a continuation of Ser. No. 447,495, Mar. 4, 1974, abandoned. This application Apr. 9, 1979, Ser. No. 28,375
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1973, 2310787
Int. Cl.³ A61M *7/00*; A61J *7/00*
U.S. Cl. 156—439 **6 Claims**

1. An apparatus for making a package, said apparatus comprising:
means for longitudinally advancing into a joining station a pair of foils at least one of which is formed with a succession of pockets and for aligning said foils in said station with one of said pockets of said one foil opening in a first direction transverse to the longitudinal advance direction toward the other foil with said foils spaced apart at said one pocket;
means including a support reciprocal in a second direction transverse to said first transverse direction and to said longitudinal direction for displacing into said station the free end of a wire and for positioning said free end between the spaced-apart and aligned foils within the bounds of said one pocket;
means including a pair of dies displaceable in said first transverse direction for pressing and sealing together said foils



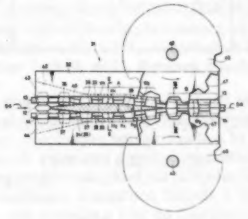
around said one pocket while leaving said one pocket open at its side opposite said wire in the second transverse direction, whereby fluent material can be introduced through said side into and held between said foils in said one pocket; and
means including at least one cutting element for severing from said wire a section at said free end.

4,257,839

APPARATUS FOR JOINING OPPOSED LEG PORTIONS OF MOLDED COUPLING ELEMENTS FOR SLIDE FASTENERS

Hiroshi Yoshida, and Shunji Akashi, both of Kurobe, Japan, assignors to Yoshida Kogyo, K.K., Tokyo, Japan

Filed Jun. 12, 1979, Ser. No. 47,720
Claims priority, application Japan, Jun. 20, 1978, 53-74659
Int. Cl.³ B29D *5/00*
U.S. Cl. 156—555 **5 Claims**



1. An apparatus for welding a row of interconnected thermoplastic coupling elements for slide fasteners at opposed leg portions of each coupling element, said apparatus comprising, in combination:
a shaping die member having a channel extending through its length for the passage therethrough of the coupling elements;
means for feeding the coupling elements through said channel at constant speed;
softening means disposed in said channel for softening the opposed leg portions of the coupling elements;
first press means on said shaping die member for pressing the opposed leg portions of the coupling elements against said softening means on opposite sides;
second press means on said shaping die member for pressing the opposed leg portions of the coupling elements against each other, said second press means being located downstream said first press means;
said softening means including an ultrasonic horn having a central portion of a uniform thickness and a pair of first and second wedge-like portions each having a progressively decreasing thickness;

said first press means being defined by a pair of first and second portions of said channel;

said channel having at said first portion a uniform width slightly smaller than the total thickness of the opposite leg portions of one of the coupling elements plus the thickness of said central portion of the ultrasonic horn, and at said second portion a progressively decreasing width slightly smaller than the total thickness of the opposite leg portions of one of the coupling elements plus the thickness of said first wedge-like portion of the ultrasonic horn;

said second press means being defined by a third portion of said channel, said channel having at said third portion a substantially uniform width slightly smaller than the total thickness of the opposed leg portions of one of the coupling elements; and;

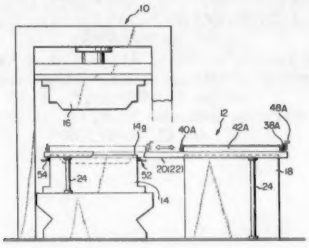
said ultrasonic horn being ultrasonically vibratable in a direction parallel to confronting inner surfaces of the coupling element leg portions.

4,257,840

HOT-PRESS MACHINE WITH FACING LAYER CARRYING AND SETTING APPARATUS

Toshihiko Fujii, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 12, 1978, Ser. No. 941,740
Int. Cl.³ B32B *31/04*
U.S. Cl. 156—556 **10 Claims**



1. A system for producing a trim board which comprises a substrate of corrugated paperboard and a facing layer which is laid on one side of said corrugated paperboard, comprising:

a hot-press machine including a stationary die and a moveable die, said movable die being movable to press a facing layer against a shaped corrugated paperboard which is previously positioned on said stationary die;

first means having a flat top surface which is located beside said stationary die and is substantially flush with the top of said stationary die;

conveying means for conveying said facing layer from said flat top surface of the first means to said stationary die over said shaped corrugated paperboard, said conveying means including two spaced guide rails which extend in a substantially parallel relationship and which locate said stationary die and said first means therebetween, two movers which are slidable on and along said guide rails respectively between said first means and said stationary die, and a connecting rod having opposed ends respectively connected to said movers to provide simultaneous movements of said movers;

first clamping means mounted to said movers and movable therewith, said first clamping means being capable of clamping longitudinally opposed ends of said facing layer on said flat top surface; and

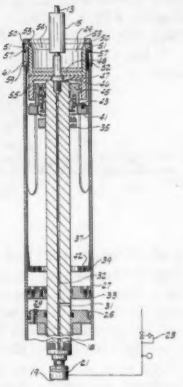
second clamping means mounted to said stationary die, said second clamping means being capable of clamping laterally opposed ends of said facing layer when said facing layer having been clamped by said first clamping means is brought, by said movers, to a position to cover said stationary die.

4,257,841

STABILIZING AND SUPPORTING APPARATUS FOR FLOAT ZONE REFINED SEMICONDUCTOR CRYSTAL ROD

John M. Ross; Kedar P. Gupta; Horst G. Kramer, and John W. Burd, all of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 6, 1978, Ser. No. 867,640
Int. Cl.³ C30B *13/00*
U.S. Cl. 156—620 **20 Claims**



1. Method for refining enlarged crystal semiconductor rod formed from the action of a crystal seed rod on a float zone melt of a crystalline rod source comprising:

arranging the semiconductor crystalline rod source in a float zone melt environment with a crystal seed rod axially aligned thereto and attached to a lower portion thereof; generating a float zone melt with the junction of the crystal seed rod and the crystalline rod source and moving the float zone away from said junction resulting in the production of a cylindrical crystal semiconductor rod; and uniformly stabilizing and supporting the enlarged crystal semiconductor rod being drawn on the crystal seed rod in order to prevent misalignment at the juncture of the melt; growing crystal semiconductor rod from the crystalline rod source, the uniform stabilizing and supporting of the growing crystal semiconductor being accomplished by moving upwardly in axially register with the crystal rod lower end portions, a tube to a position surrounding the growing crystal rod base; engaging the growing crystal rod base with individually engaging fingers at differing engagement angles from the inside diameter of the tube and contacting the fingers with the surface of the crystal rod.

4,257,842

PREPARING PERMANENTLY EMBOSSED, HIGHLY POROUS WALLPAPERS

Vittorio Ciaccia, and Paolo Parrini, both of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Division of Ser. No. 808,570, Jun. 21, 1977, abandoned. This application Jun. 18, 1979, Ser. No. 49,088
Claims priority, application Italy, Jun. 22, 1976, 24557 A/76; Aug. 18, 1976, 26334 A/76
Int. Cl.³ D21H *5/20, 5/00*; B29C *17/00*
U.S. Cl. 162—117 **4 Claims**

1. Process for the preparation of permanently embossed, highly porous wallpaper, which process comprises:

(1) preparing a sheet from a mixture comprising up to 90% by weight of cellulose fibers and at least 10% by weight of fibrils of at least one thermoplastic polymer, said fibrils having a surface area greater than 1 m^2/g, and

(2) subjecting the sheet to the following operations (a) and (b), in whatever sequence:

(a) embossing the sheet while the sheet is at a temperature lower than the softening temperature of said thermoplastic polymer,

(b) heating the sheet while the sheet is at a temperature equal to or higher than the softening temperature of said thermoplastic polymer, for a time sufficient to melt at least a part of the fibrils incorporated in the sheet.

4,257,843

METHOD FOR THE PRODUCTION OF A MATTED TRANSPARENT PAPER AND THE PRODUCT THEREOF

Noritoshi Watanabe, Nishinomiya; Masato Nakamura, Toyonaka, and Seigoro Fujita, Amagasaki, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 723,137, Sep. 14, 1976. This application Nov. 6, 1978, Ser. No. 957,834

Claims priority, application Japan, Sep. 18, 1975, 50-113176

The portion of the term of this patent subsequent to Sep. 4, 1996, has been disclaimed.

Int. Cl.[3] D21H *5/12*

U.S. Cl. 162—146 **8 Claims**

1. A matted transparent paper manufactured by the steps of preparing a paper from an aqueous suspension of pulp having a CSF larger than 100 cc, moistening said paper so as to have a moisture content within the range of 5 to 30%, and calendering said moistened paper with the use of a heated embossing metal roll having a surface temperature of 50° to 200° C. to transparentize said moistened paper and form a finely embossed surface thereon, said embossing metal roll having a peripheral surface engraved so as to have a surface roughness of a Rmax of 25 to 160 microns and a relief peak number of 1 to 20 per 1 mm, and said pulp consisting essentially of wood pulp or a mixture of wood and synthetic pulp, at least 10% by-weight of the mixture being wood pulp.

4,257,844

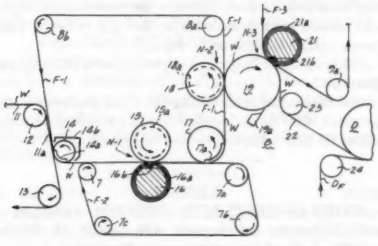
PRESS SECTION ARRANGEMENT

Arnold J. Schmitt, and Cornelius Rempel, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 787,925, Apr. 15, 1977, abandoned, which is a continuation of Ser. No. 694,473, Jun. 9, 1976, abandoned, which is a continuation of Ser. No. 583,288, Jun. 3, 1975, abandoned. This application Mar. 19, 1979, Ser. No. 21,911

Int. Cl.[3] D21F *3/04*

U.S. Cl. 162—305 **7 Claims**



1. In a paper machine, the combination comprising:

a forming wire traveling over a couch roll to a turning roll in a pickup run and carrying a web on its outer surface;

an upper first looped felt traveling over a pickup roll and in close running relation with said wire at said pickup run to pick off said web from said wire and carry said web from said wire on an outer surface of said felt;

a lower second looped felt traveling over a first guide roll and into supporting contact with a lower surface of said web as said web is being carried by said first felt;

a first high pressure press nip positioned in working relation to said first and second felts carrying the web therebetween, said first press nip being defined by an upper first roll within the first felt downstream from the pickup roll and a lower second grooved press roll within the second felt downstream from said first guide roll;

a suction transfer means positioned within the loop of said first felt following said first press nip so as to guide the web to follow the first felt away from said second felt;

a second guide means positioned within the loop of said second felt downstream of said first press nip positioned so as to guide said second felt in continuous supporting contact with the web until the web is transferred to the first felt;

a second press nip positioned after the transfer means receiving said first felt carrying the web, said second press nip being defined by a grooved third press roll within the loop of said first felt and a plain-surfaced fourth press roll in direct contact with the web carried by said first felt, said web being carried on the peripheral surface of said plain-surfaced press roll from said second nip;

a third guide roll positioned within the loop of said first felt downstream of said second press nip so as to guide said first felt away from said second press nip and away from said plain-surfaced press roll;

a third press nip defined between said plain surfaced roll and a fifth press roll and receiving the web after said second press nip;

a third felt passing through said third nip with said web; and

means for removing the web from said plain-surfaced roll after said third nip.

4,257,845

MIXING AND DISTRIBUTING DEVICE FOR GASES HAVING HIGH TEMPERATURE

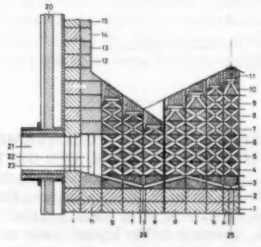
Johannes Lukaszewicz; Ulrich Müller-Frank, both of Bergisch Gladbach, and Herbert Reutler, Hohkeppel, all of Fed. Rep. of Germany, assignors to GHT, Gesellschaft fur Hochtemperaturreaktor-Technik mbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Mar. 2, 1978, Ser. No. 882,755

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709171

Int. Cl.[2] G21C *19/28*

U.S. Cl. 176—58 PB **8 Claims**



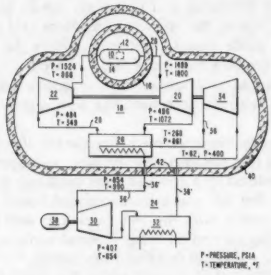
1. Mixing and distributing device for gases of a nuclear reactor having high temperature comprising a multiplicity of polygonal blocks stacked in a plurality of layers above and laterally adjacent one another, each of said blocks being formed with at least two channels having respective axes extending from a corner of each of said blocks to the center thereof, each channel having an end communicating with all other channels formed in a given block and another end communicating with at least one adjacent channel formed in adjacent blocks.

4,257,846

BI-BRAYTON POWER GENERATION WITH A GAS-COOLED NUCLEAR REACTOR

Bill L. Pierce, Whitehall, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 19, 1978, Ser. No. 870,893
Int. Cl.[2] G21C *15/22*
U.S. Cl. 176—60 **2 Claims**



1. Apparatus for generating power from a high temperature nuclear reactor circulating a gas coolant, said apparatus comprising:

a. a primary Brayton-type circuit including means for serially circulating said gas coolant through said reactor, a primary turbine, primary heat exchanger, a primary compressor and back to said reactor;

b. a secondary Brayton-type circuit including means for serially circulating a working fluid through said primary heat exchanger in heat exchange relation with said gas coolant, a secondary turbine, secondary pre-cooling means, a secondary compressor and back to said heat exchange means; and

c. means for extracting work from said primary turbine to drive said primary and secondary compressors comprising a mechanical connection among said primary turbine, primary compressor and secondary compressor

d. a sealed containment structure wherein said reactor, said primary turbine, said primary and secondary compressors, and said primary heat exchanger are disposed within said containment and wherein said secondary turbine and said secondary precooling means are disposed externally of said containment.

4,257,847

NUCLEAR BREEDER REACTOR FUEL ELEMENT WITH AXIAL TANDEM STACKING AND GETTER

Ronald L. Gibby, Richland; Leo A. Lawrence, Kennewick; Robert E. Woodley; Charles N. Wilson, both of Richland; Edward T. Weber, Kennewick, all of Wash., and Carl E. Johnson, Elk Grove, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 6, 1978, Ser. No. 949,340
Int. Cl.[3] G21C *3/02*
U.S. Cl. 176—68 **7 Claims**

1. An improved breeder reactor fuel element including a tubular cladding hermetically sealed at each end by an end plug, one interior portion of the cladding defining a fuel plenum filled with a column of fissile material, and a column of fertile material arranged axially in tandem with the fissile column within the cladding, wherein the improvement comprises a cesium getter disposed between the fissile and fertile columns which is substantially effective at reactor operating

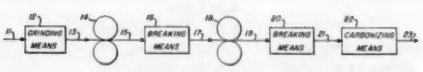
temperatures to isolate the cesium generated by the fissile material from reacting with the fertile column.

4,257,848

APPARATUS FOR PRODUCING BLAST FURNACE COKE BY COAL COMPACTION

William E. Brayton, Penn Hills Township, Allegheny County; Fay Fun, Monroeville; Luther G. Hendrickson, Churchill, and Ronald W. Shoenberger, Monroeville, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 865,818, Dec. 30, 1977, Pat. No. 4,186,054.
This application Apr. 2, 1979, Ser. No. 25,970
Int. Cl.[3] C10B *45/00, 45/02*
U.S. Cl. 202—82 **5 Claims**



1. Apparatus for producing blast furnace coke comprising:

(a) means for blending various finely divided coals wherein at least about 60% by weight of the coal has a diameter of less than about ⅛ inch;

(b) means for compacting this finely divided blended coal to form a compact;

(c) means for breaking the thus formed compact such that the bulk density is sufficiently increased to be capable of conversion into coke suitable for use in large blast furnaces upon carbonization thereof;

(d) means for charging a coking oven with the broken compact; and

(e) oven means for carbonizing the oven contents to thereby produce blast furnace coke having a minimum hardness of about 68 and a minimum stability of about 55.

4,257,849

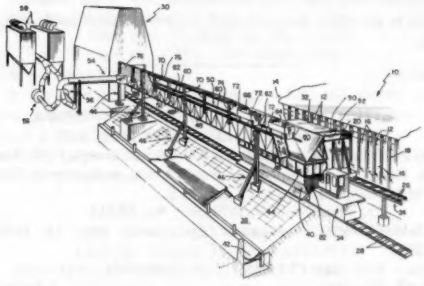
COKE GUIDE FUMES CONTROL SYSTEM

Pramodh Nijhawan, Indianapolis, and Joseph M. Duckworth, Zionsville, both of Ind., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Mar. 12, 1979, Ser. No. 19,651
Int. Cl.[3] C10B *39/02*
U.S. Cl. 202—228 **3 Claims**

1. A contaminant capture system for a coke oven pushing operation for a coke oven battery having a coke side provided with a coke guide movable along the battery for guiding coke from a selected oven of the battery during the push and a conveyor means movable along the battery to receive the coke

pushed through the guide and convey it to a quenching station, the system including suction means, a first duct extending along the battery and coupled to the suction means for evacuation thereby, the first duct including a wall portion closed by a flexible web, a car disposed for movement along the duct to raise the web to couple the interior of the car to the interior of the duct, mobile first hood means, means for coupling the first hood means to the car, means for moving the car to dispose the first hood means in overlying relation to a selected portion of the conveyor means to draw into the first hood means contaminants evolved as hot coke is transported on said conveyor means, mobile second hood means mounted on the coke guide, a second duct for connecting said first hood means in flow communication with said second hood means, auxiliary ventilation hood means surmounting said second hood means such



that an internal shroud space is established between said second hood means and said ventilation hood means, a conduit for connecting said ventilation hood means in flow communication with said second hood means; blower means inclusive of filtration means for withdrawing contaminated gases from said shroud space and delivering filtered gases to said first duct via said conduit, said second hood means, said second duct, said first hood and said car, respectively; means being provided with a first exhaust port controlled by a first damper and with a second exhaust port controlled by a second damper, said first exhaust port connected in flow communication with said conduit, said second exhaust port discharging to the atmosphere, said first and second dampers being simultaneously controllable such that when one of said dampers is fully opened, the other of said dampers is fully closed.

4,257,850

PURIFICATION OF 1,2-DICHLOROETHANE RECOVERED IN THE INCOMPLETE THERMAL CRACKING TO VINYL CHLORIDE

Gerhard Rechmeier, Erftstadt; Ulrich Roesnik, Hürth, and Harald Scholz, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

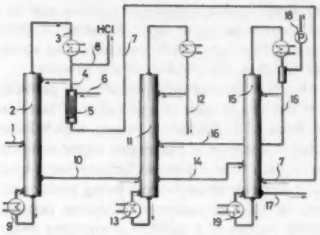
Filed Jan. 25, 1980, Ser. No. 115,205

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1979, 2903640

Int. Cl.³ B01D *3/34*

U.S. Cl. 203—29 **2 Claims**

1. In a process for purifying 1,2-dichloroethane which is recovered during incomplete thermal cracking to vinyl chloride and contains contaminants boiling at a temperature lower than 83.7° C. under a pressure of 1011 millibars, briefly termed low boilers hereinafter, and contaminants boiling at a temperature higher than 83.7° C. under a pressure of 1011 millibars, briefly termed high boilers hereinafter, wherein the low boilers are distilled off overhead from contaminated 1,2-dichloroethane, in a first distilling zone; a portion of low boiler concentrate is continuously treated at 30° to 85° C. with gaseous chlorine and converted to high boilers; pure 1,2-dichloroethane is distilled off overhead from the high boilers, in a second distilling zone; and residual dichloroethane is distilled off under reduced pressure from high boiler concentrate, in a third distilling zone, and the high boilers are removed, the improve-



ment which comprises: introducing high boiler-containing effluent coming from the chlorination of low boiler concentrate into the lower portion of the third distilling zone.

4,257,851

PURIFICATION OF NAPHTHOQUINONE

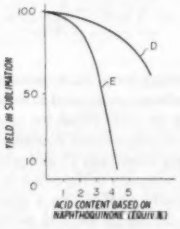
Ryo Matsuura, Yamato; Kazuaki Sakai, Fujisawa; Tuneyasu Sato, Chigasaki; Yorinobu Yamada, and Kowzo Bandow, both of Kawasaki, all of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Filed Mar. 22, 1979, Ser. No. 22,878

Claims priority, application Japan, Mar. 27, 1978, 53-35825; Apr. 26, 1978, 53-49466

Int. Cl.³ B01D *3/10;* **C07C** *50/00*

U.S. Cl. 203—31 **9 Claims**



1. In a process for purifying crude naphthoquinone obtained by oxidation of naphthalene, the improvement comprising the steps of reducing the acid content of the crude naphthoquinone to less than 5 equivalent percent as a mono-basic acid based on naphthoquinone distilling the acid-reduced naphthoquinone at reduced pressure and recovering purified naphthoquinone as a distillate.

4,257,852

DISTILLATION OF AQUEOUS TERTIARY BUTYL HYDROPEROXIDE

G. Richard Worrell, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 15, 1979, Ser. No. 3,311

Int. Cl.³ B01D *3/32*

U.S. Cl. 203—99 **4 Claims**

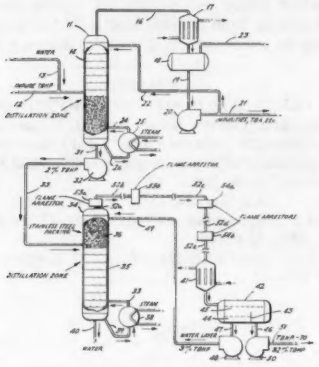
1. A process for the preparation of an aqueous solution containing about 32 mol percent tertiary butyl hydroperoxide from an impure aqueous system comprising tertiary butyl hydroperoxide which process comprises:

subjecting a stream of said dilute aqueous system comprising tertiary butyl hydroperoxide to a total distillation system for separating at least one stream containing impurities, more volatile than tertiary butyl hydroperoxide and for separating at least one stream containing impurities less volatile than tertiary butyl hydroperoxide, and for recov-

ering from a distillation tower a stream containing H_2O and more than 10 mol percent tertiary butyl hydroperoxide;

subjecting said stream containing H_2O and more than 10% tertiary butyl hydroperoxide to cooling and to decantation to recover an upper layer consiting of about 32 mol percent tertiary butyl hydroperoxide and about 68 mol percent water as the product of the process;

coping with the flammability problem by providing flame arrestor devices at each of a plurality of locations downstream from said distillation tower, which locations are subjected to a stream of flammable vapor comprising H_2O and more than 10 mol percent tertiary butyl hydroperoxide, such flame arrestor devices being positioned in those portions of said downstream locations containing said flammable vapors of a mixture comprising more than 10



mol percent tertiary butyl hydroperoxide and such flame arrestor devices being positioned at locations spaced apart from each other by from about ten to about thirty effective diameters of vapor lines containing said flammable vapor comprising more than 10 mol percent tertiary butyl hydroperoxide, whereby in the event of an accidental fire, such fire is initially confined to a zone between nearby flame arrestors during an alerting period appropriate for bringing such fire under control, said use of said flame arrestors permitting distillation of a vapor forming a condensate containing a larger concentration of tertiary butyl hydroperoxide than would be attainable from condensate from nonflammable vapors, thereby recovering a given quantity of 32 mol percent tertiary butyl hydroperoxide at both capital costs and operating costs lower than when condensate is obtained only from nonflammable vapors.

4,257,853

METAL PLATING PROCESS

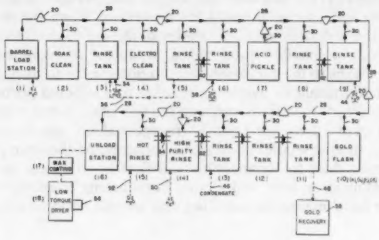
Carrol D. Quinton, Lemont, and Raphael Guio, Chicago, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 6, 1978, Ser. No. 949,305

Int. Cl.³ C25D *5/34, 5/48, 17/16, 17/28*

U.S. Cl. 204—32 R **51 Claims**

1. In a method for metal plating a work load which is carried generally in a path of travel from a pre-plating treatment tank or the like, through air into and out of a plating tank, and from said plating tank to a post-plating treatment tank or the like, and in which said work load is rotatable during its travel along said path, the improvement comprising the steps of rotating said work load at a first rate of rotation while in said plating tank, and rotating said work load at a varying rate of rotation



while in air when the work load is removed from said plating tank.

4,257,854

METHOD OF PRODUCING OBJECTS WITH A SUPERSMOOTH ALUMINUM SURFACE

Theo E. G. Daenen; Johannes M. Oomen, and Joseph F. M. Van de Berg, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,912

Claims priority, application Netherlands, Dec. 12, 1978, 7812062

Int. Cl.³ C25D *5/52, 7/08, 3/44*

U.S. Cl. 204—36 **4 Claims**

1. A method of producing an article having an aluminum surface with a surface with a maximum surface roughness R_T of not more than 0.02 microns comprising forming by electroplating a layer of aluminum of at least 10 microns thick on an article having a metallic surface and then subjecting said aluminum surface to a mechanical polishing operation.

4,257,855

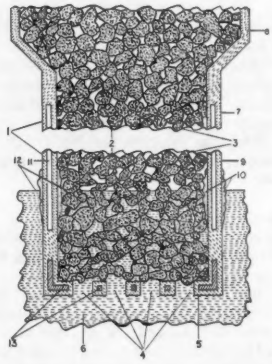
APPARATUS AND METHODS FOR THE ELECTROLYTIC PRODUCTION OF ALUMINUM METAL

Solomon Zaromb, 171 Clifton Ave., Newark, N.J. 07104

Filed Jul. 14, 1978, Ser. No. 924,817

Int. Cl.² C25B *11/03;* **C25C** *3/06*

U.S. Cl. 204—67 **18 Claims**



13. A method of supplying consumable carbon anode material to an aluminum-producing electrolytic cell, which comprises:

(a) causing pieces of electrochemically consumable carbon

to drop into a permanent hollow anode structure so as to form a packed bed of carbon within said structure;

(b) causing a lower portion of said anode structure and of said packed bed to be submersed in a molten salt bath of said electrolytic cell; and

(c) causing electric current to flow from said permanent structure to said packed bed and thence through said molten salt bath to the cathode of said electrolytic cell so as to form aluminum metal near said cathode.

4,257,856

ELECTROLYTIC PROCESS USEFUL FOR THE ELECTROLYSIS OF WATER

Gerardo Beni, Westfield; William C. Dautremont-Smith, Cranford; Lawrence M. Schiavone, Howell, and Joseph L. Shay, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 17, 1979, Ser. No. 85,819

Int. Cl.³ C25G *1/04;* C25B *11/08*

U.S. Cl. 204—129 **4 Claims**

4. An electrolytic cell comprising a first and second electrode characterized in that said first electrode comprises sputtered iridium oxide, said second electrode is adapted to promote the production of hydrogen, and means are provided for collecting hydrogen.

4,257,857

LIQUID PHASE PREPARATION OF 2-CHLORO-5-TRIFLUOROMETHYLPYRIDINE AND 2-CHLORO-5-PERCHLOROFLUOROMETHYLPYRIDINE

Graham Whittaker, and Anne O'Brien, both of Frodsham, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 19, 1979, Ser. No. 95,679

Claims priority, application United Kingdom, Jan. 22, 1979, 02196/79

Int. Cl.³ B01J *19/08;* C07D *213/26*

U.S. Cl. 204—158 HA **10 Claims**

1. A process for the selective preparation of 2-chloro-5-trifluoromethylpyridine or a 2-chloro-5-perchlorofluoromethylpyridine which comprises chlorinating 3-trifluoromethylpyridine or a 3-perchlorofluoromethylpyridine respectively in the liquid phase by contacting the 3-trifluoromethylpyridine or a 3-perchlorofluoromethylpyridine respectively with chlorine in the presence of ultraviolet radiation and a liquid organic diluent solvent.

4,257,858

PHOTOCHEMICAL METHOD FOR PRODUCING BIOCIDAL 2-ARYL-1,3-CYCLOHEXANEDIONE COMPOUNDS

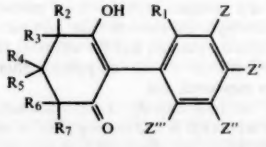
Thomas N. Wheeler, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 781,985, Mar. 28, 1977. This application Jan. 22, 1980, Ser. No. 114,348

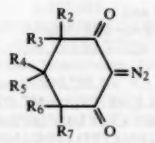
Int. Cl.³ B01J *19/12*

U.S. Cl. 204—158 R **1 Claim**

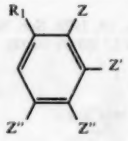
1. A method of preparing a compound of the formula:



which comprises reacting a compound of the formula:



with a compound of the formula:



in the presence of ultraviolet radiation having a wavelength of greater than 290 nanometers, wherein:

Z, Z′, Z″ and Z‴ are individually hydrogen, polyhaloalkyl, halogen, cyano, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoyl, amido, or haloalkyl;

R_1 is alkyl;

R_2, R_3, R_4, R_5, R_6 and R_7 are individually hydrogen or either substituted or unsubstituted alkyl or phenyl wherein the permissible substituents are one or more alkyl, cyano, halogen, nitro, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl or dialkylamino substituents; or any two R_3, R_4, R_5, R_6, R_7 or R_8 substituents; together may form an alkylene or alkenylene chain having from 2 to 20 carbon atoms completing a 3, 4, 5, 6, or 7 membered ring structure;

with the proviso that R_1, R_2, R_3, R_4, R_5, R_6, R_7 Z, Z′, Z″ and Z‴ substituents individually may not include more than ten aliphatic carbon atoms.

4,257,859

BENZOIN PHOTOINITIATOR CONTAINING A QUATERNARY AMMONIUM GROUP IN PHOTO CURABLE COMPOSITION AND PROCESS

Martin Fischer; Werner Kuesters; Erich Penzel; Wolfgang Rehder, and Walter Trautmann, all of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

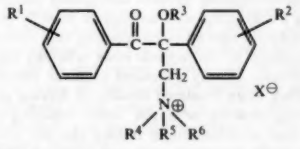
Filed Jul. 12, 1979, Ser. No. 57,084

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1978, 2831263

Int. Cl.³ C08J *3/28*

U.S. Cl. 204—159.23 **7 Claims**

1. A photopolymerizable mixture which comprises: at least one olefinically unsaturated compound and at least one photoinitiator of the formula I



(I)

where

R^1 and R^2 are identical or different and each is H, halogen, phenyl, C_1–C_6-alkyl, C_1–C_6-alkoxy or C_1–C_6-alkylthio,

R^3 is H, C_1–C_6-alkyl, hydroxyalkyl, cycloalkyl or aralkyl,

R^4 and R^5 are identical or different and each is C_1–C_6-alkyl, phenyl, cycloalkyl or aralkyl or

R^4 and R^5 together are a —$(CH_2)_4$—bridge, a —$(CH_2)_5$— bridge or a —$(CH_2)_2$—O—$(CH_2)_2$—bridge,

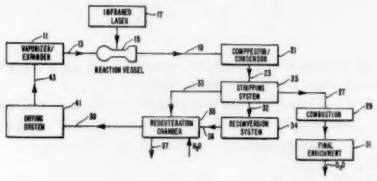
R^6 is C_1–C_6-alkyl and
$X^{\ominus}$ is $Cl^{\ominus}$, $Br^{\ominus}$, $I^{\ominus}$or $CH_3SO_4^{\ominus}$.

4,257,860

DEUTERIUM ENRICHMENT BY SELECTIVE PHOTOINDUCED DISSOCIATION OF A MULTIHALOGENATED ORGANIC COMPOUND

John B. Marling, Livermore, and Irving P. Herman, Oakland, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 19, 1978, Ser. No. 943,833
Int. Cl.[3] **B01D** *59/00, 59/34*
U.S. Cl. 204—162 R **28 Claims**



1. A method for deuterium enrichment which comprises:
providing a gas phase source of deuterium, said source being a multihalogenated organic compound selected from the group consisting of a dihalomethane, a trihalomethane, a 1,2-dihaloethene, a trihaloethene, a tetrahaloethane, and a pentahaloethane;
subjecting said multihalogenated organic compound to infrared radiation with a pulse duration in the range of about one to about thirty nanoseconds at a preselected wavelength and of sufficient intensity to selectively excite and induce dissociation of those molecules containing deuterium to form a deuterium enriched dissociation product and a deuterium depleted undissociated multihalogenated organic compound product; and
separating the deuterium enriched dissociation product from the deuterium depleted undissociated multihalogenated organic compound product.

4,257,861

ELECTROCOATING COMPOSITIONS AND ELECTROCOATING METHOD

John H. Lupinski, Scotia, and Wilson J. Barnes, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 908,543, May 22, 1978, abandoned, which is a division of Ser. No. 722,019, Sep. 10, 1926, abandoned. This application Dec. 3, 1979, Ser. No. 99,620
Int. Cl.[3] **C25D** *13/06*
U.S. Cl. 204—181 R **2 Claims**

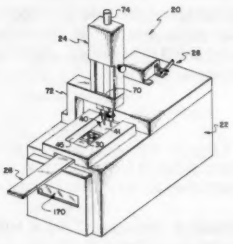
1. In an electrocoating process comprising electrophoretically coating a conductor with an organic resin by passing the electrical conductor into an electrocoating bath comprising an aqueous dispersion of the organic resin whereby the organic resin is electrophoretically deposited onto the electrical conductor resulting in an insulated conductor having an organic resin insulating coating with pin holes requiring a second application step to substantially reduce the pin holes in the electrophoretically deposited resin and a baking step, the improvement which comprises utilizing as the electrocoating bath, a colloidal dispersion of a polyimide in an aqueous organic solvent medium which is formed by
(1) making a sprayable, substantially uniform mixture of a polyimide and an organic solvent,
(2) introducing the sprayable mixture of (1) into water under conditions of high agitation to produce a colloidal dispersion where the electrocoating bath consists essentially of
(A) 5 to 45% of organic solvent,
(B) 40% to 94% of water and
(C) 1% to 15% of a polyimide reaction product of trimellitic anhydride, methylenedianiline and toluene diisocyanate,
where the sum of (A)+(B)+(C) is 100%, whereby a pinhole-free organic resin coating is formed which does not require a second application step.

4,257,862

CHEMICAL ANALYZER

Paul N. Schnipelsky, Rochester, and Raymond F. Jakubowicz, Canandaigua, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,702
Int. Cl.[3] **G01N** *27/28*
U.S. Cl. 204—195 R **4 Claims**



1. A portable analytical device for measuring the activity of ions in a biological fluid wherein a plurality of operations are performed on a test element containing a pair of ion-selective electrodes, said device comprising:
track means for receiving a test element from a supply thereof and for supporting the element during each of said operations, said track means providing continuous bearing surface on which the element is moved through the device;
housing means for supporting said track means in a fixed position relative to said test element;
metering means operable in a first location adjacent said track means for substantially simultaneously depositing a predetermined quantity of reference fluid on one electrode and a predetermined quantity of sample fluid on the other electrode of a test element supported in a metering position on said surface, said metering means being operable at a second location to aspirate fluid into said metering means and movable between said locations;
analysis means for measuring an electrical potential developed in a test element bearing said fluids and supported on said track means in a sensing position, said analysis means comprising contact means supported for pivotal movement over said track means;
transfer means for advancing said test element through said device, said transfer means comprising an elongate member mounted for reciprocative movement in said track means, said elongate member being manually actuatable for advancing a test element from said metering position to said sensing position and for effecting the removal of said element from the sensing position after the potential has been measured; and
means for pivotally moving said contact means and a test element supported in said sensing position relative to each other to effect an electrical connection between the contact means and said electrodes.

4,257,863
GAS SENSORS AND METHOD OF MAKING SUCH SENSORS

John W. Hoffman, Beecroft, Australia, assignor to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed Jun. 12, 1979, Ser. No. 47,691
Int. Cl.[3] G01N *27/58*
U.S. Cl. 204—195 S 12 Claims

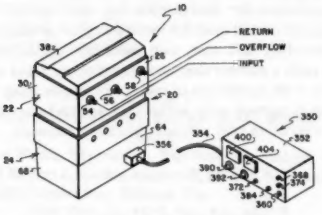
1. In a sensor to determine oxygen concentration in gases comprising a tubular solid electrolyte substrate and an outer porous circumferential electrode layer of electrode metal which in use of the sensor element is exposed to gases to be analyzed, the improvement which comprises an intermediate porous layer of compatible electrolyte material intimately bonded to said substrate and to which the outer electrode layer is in turn intimately bonded, and a further porous layer of compatible electrolyte material intimately bonded to said electrode layer and with which chemical species react to substantially prevent reactions taking place at the electrolyte/electrode interface of the sensor.

7. A method of manufacturing a gas sensor comprising the steps of cleaning the surface of a tubular solid electrolyte substrate, intimately bonding a porous layer of compatible electrolyte material to said substrate, intimately bonding a porous circumferential layer of electrode metal to said electrolyte layer, and intimately bonding a porous layer of compatible electrolyte material to said electrode layer, and with which chemical species react to substantially prevent reactions taking place at the electrolyte/electrode interface of the sensor.

4,257,864
PORTABLE SILVER RECOVERY UNIT

Leonard W. Gacki, 31 Wellington Ter., White Plains, N.Y. 10607

Filed Aug. 2, 1979, Ser. No. 62,951
Int. Cl.[3] C25D *17/20;* C25C *1/00;* F16C *27/00, 17/04*
U.S. Cl. 204—213 38 Claims



1. Apparatus for recovering metal from a solution containing metal ions, comprising:

(a) a tank into which metal ion-containing solution is directed;

(b) at least one elongate anode disposed within the tank, the anode being maintained stationary with respect to the tank;

(c) a pair of spaced electrodes disposed within the tank, the electrodes being maintained stationary with respect to the tank;

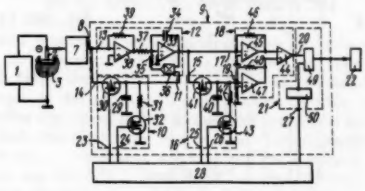
(d) an elongate cathode assembly supported for rotation between, and in electrical communication with, the electrodes, the cathode assembly being readily insertable into, and removable from, its position between the electrodes; and

(e) a cathode assembly drive for rotating the cathode assembly about a longitudinal axis, the cathode assembly drive at least partially supporting the cathode assembly during rotation of the cathode assembly.

4,257,865
ELECTROCHEMICAL WORKING METHOD AND SYSTEM FOR EFFECTING SAME

Andrei P. Semashko, ulitsa Rossiiskaya, 43/2, kv. 4; Nasikh Z. Gimaev, ulitsa 50 let SSSR, 31, kv. 12; Ivan V. Maximov, ulitsa Stepana Zlobina, 41, kv. 61; Sergei V. Bezrukov, ulitsa Kirova, 41, kv. 37, and Vladimir B. Rabinovich, ulitsa Stepana Zlobina, 42, kv. 46, all of Ufa, U.S.S.R.

Division of Ser. No. 8,580, Feb. 1, 1979, Pat. No. 4,213,834. This application Dec. 21, 1979, Ser. No. 105,910
Int. Cl.[3] B23P *1/02, 1/14*
U.S. Cl. 204—224 M 6 Claims



1. An electrochemical working system involving the use of electrodes and comprising:

a cavitation transducer connected to said electrodes; an output of said cavitation transducer;

a time control unit having outputs;

an actuator;

a working conditions control unit having an input and an output;

a unit for selecting and storing the cavitation parameter value with a minimum gap between said electrodes, incorporated in said working conditions control unit; an input, control inputs and an output of said unit for selecting and storing the cavitation parameter value with a minimum gap between said electrodes; said input being electrically connected to said output of said cavitation transducer; said control inputs being connected to said outputs of said time control unit;

a unit for calculating the relative value of the cavitation parameter function of said working conditions control unit, having a first input, a second input and an output; said first input being electrically connected to said output of said cavitation transducer; said second input being connected to said output of said unit for selecting and storing the cavitation parameter value with a minimum gap between said electrodes;

a unit for selecting and storing the relative value of the cavitation parameter function of said working conditions controlled device, having an input, an output and control inputs, said input being connected to said output of said unit for calculating the relative value of the cavitation parameter function; said control inputs being connected to said outputs of said time control unit;

a unit for comparing the actual relative value of the cavitation parameter function with a predetermined value of said working conditions control device, having a first input, a second input and an output; said first input being connected to said output of said unit for calculating the relative value of the cavitation parameter function; said second input being connected to said output of said unit for selecting and storing the relative of the cavitation parameter function;

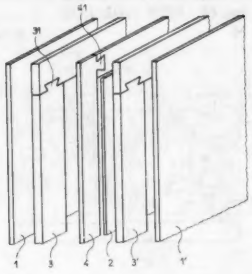
an inhibit circuit of said working conditions control device including an input, a control input and an output said input being connected to said output of said unit for comparing the actual relative value of the cavitation parameter function with a predetermined value said output serving as said output of said working conditions control device and being connected to said actuator; said control input being connected to one of said outputs of said time control unit.

4,257,866

ELECTROLYZER CELL

Pierre Belle, Meylan, and Jacques Poux, Grenoble, both of France, assignors to Alsthom-Atlantique, Paris, France

Filed Oct. 30, 1979, Ser. No. 89,391
Claims priority, application France, Nov. 10, 1978, 78 31806
Int. Cl.³ C25B *9/00, 13/00*
U.S. Cl. 204—253 **9 Claims**



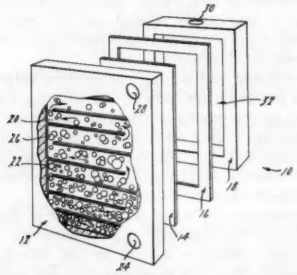
1. In a filter-press type of electrolyser cell having a pair of electrodes, a diaphragm separating the pair of electrodes, and a pair of fluid-tight insulating frames, said diaphragm being sandwiched between said pair of fluid-tight insulating frames, the improvement wherein each of said fluid-tight frames comprises an assembly of a plurality of elongate components fitted together by interlocking joints.

4,257,867

INERT GAS REJECTION DEVICE FOR ZINC-HALOGEN BATTERY SYSTEMS

Michael J. Hammond, Sterling Heights, and Mark W. Arendell, Warren, both of Mich., assignors to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Mar. 28, 1980, Ser. No. 134,928
Int. Cl.³ C25B *9/00, 11/03, 11/12*
U.S. Cl. 204—265 **29 Claims**



1. A cathode assembly for reducing chlorine gas in an electrolytic cell used for removing foreign gases from a zinc-halogen battery system, comprising:

(a) an electrode having first and second opposing faces;

(b) channel means, formed in said first face, for directing the flow of said chlorine and foreign gases through said cathode assembly;

(c) a porous gas-impermeable membrane sealed to said first face of said electrode over said channel means;

(d) carbonaceous particles packed in said channel means;

(e) an inlet port connecting said second face of said electrode with a first end of said channel means; and

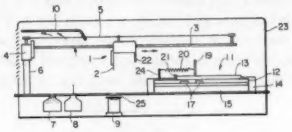
(f) an outlet port connecting said second face of said electrode with a second end of said channel means.

4,257,868

AUTOMATIC SERUM APPLICATOR WITH SERUM DRYING-PREVENTIVE MECHANISM

Heihachi Arima, Hachiouji, and Toshio Shinohara, Chofu, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1980, Ser. No. 134,333
Claims priority, application Japan, Mar. 30, 1979, 54-37974
Int. Cl.³ G01N *27/26, 27/28*
U.S. Cl. 204—299 R **4 Claims**



1. In an automatic serum applicator so adapted as to insert the blade tips of a serum applicating member into sera filled in sample trays for applying sera to said blade tips and then place said blade tips onto a carrier for serum application, an automatic applicator with serum drying-preventive mechanism comprising a case for accommodating said sample trays, a member placed in said case for moistening air in said case and a lid for covering said case, said automatic applicator being adapted in such a manner that said case is opened and closed in conjunction with operations of said serum applicating member and said lid is opened only when sera are to be applied to a carrier by operating said serum applicating member.

4,257,869

LIQUEFACTION OF ACID TREATED COAL

Joseph J. Dickert, Jr., Yardley, Pa.; Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Aug. 17, 1979, Ser. No. 67,426
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—8 LE **14 Claims**

1. A process for liquefaction of coal by reaction of crushed coal in an aromatic recycle solvent derived in the process, the improvement which comprises extracting inorganic mineral constituents from the coal by contact with aqueous hydrochloric acid and reacting the demineralized coal in an aromatic solvent for a reaction period of not substantially more than about five minutes at an elevated temperature of about 700° F. to 900° F.

4,257,870
PROCESS FOR THE PURIFICATION OF UNDISTILLABLE SOLID-CONTAINING HYDROCARBON FRACTIONS PRODUCED IN COAL-REFINING

Sigurd Jorzyk, Saarbrucken, and Helmut Wurfel, Blieskastel, both of Fed. Rep. of Germany, assignors to Saarbergwerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 7, 1979, Ser. No. 101,351

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1978, 2853366

Int. Cl.³ C10C *3/14*

U.S. Cl. 208—39 **10 Claims**

1. Process for the separation of solids from solids-containing undistillable liquid hydrocarbon fractions which are produced, along with other product components, in the refining of coal under high temperatures, characterized in that the liquid hydrocarbon fractions are solidified by cooling, and in a pulverized form are brought into contact with a solvent and that first the solid matter and then the solvent are separated from the solution.

4,257,871
USE OF VACUUM RESIDUE IN THERMAL CRACKING

Hans J. Wernicke, Wolfratshausen, and Klaus D. Mikulla, Geretsried, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 9, 1979, Ser. No. 82,454

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843793

Int. Cl.³ C10G *69/06*

U.S. Cl. 208—57 **10 Claims**

1. In a process comprising subjecting a normally liquid hydrocarbon mixture to a hydrogenation treatment and to a subsequent thermal cracking step to produce normally gaseous olefins, the improvement which comprises employing as said normally liquid hydrocarbon mixture a blend of substantially asphalt-free vacuum residue having an initial boiling point of at least about 520° C. with a hydrocarbon blending agent having a lower initial boiling point than said substantially asphalt-free vacuum residue, both said substantially asphalt-free vacuum residue and said hydrocarbon blending agent being derived from an atmospheric residue.

4,257,872
LOW PRESSURE HYDROCRACKING OF REFRACTORY FEED

Rene B. La Pierre, Morrisville, Pa.; David S. Shihabi, Pennington, and Robert L. Smith, Hopewell, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 22, 1979, Ser. No. 86,875

Int. Cl.³ C10G *47/16, 65/10*

U.S. Cl. 208—59 **12 Claims**

1. A dual bed process for upgrading a refractory hydrocarbon feed, characterized by a Bromine No. greater than about 10 and an aromatics content of at least about 40 weight percent, which comprises contacting a stream of said feed initially in a hydrotreating zone containing a bed of hydrotreating catalyst under reaction conditions which include a pressure within the range of about 100 to about 3000 psig, a temperature between 550° F. and about 850° F. in the presence of between about 2.4 and about 24 moles of hydrogen/mole of hydrocarbon charge; passing the entire effluent from said hydrotreating zone to a hydrocracking zone containing a bed of hydrocracking catalyst comprising an alkali metal non-acidic crystalline aluminosilicate zeolite characterized by an alpha activity of less than about 10, a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12 under reaction conditions which include a pressure within the above stated range, a hydrogen concentration between about 2 and about 23 moles of hydrogen per mole of charge to said latter zone and a temperature between about 650° F. and about 950° F. and recovering a product of reduced pour point directly from the aforenoted dual bed sequential operation.

4,257,873
HYDROCRACKING WITH MOLTEN ZINC CHLORIDE CATALYST CONTAINING 2–12% FERROUS CHLORIDE

Clyde W. Zielke, McMurray, and Gary H. Bagshaw, Library, both of Pa., assignors to Conoco, Inc., Stamford, Conn. and The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 10, 1979, Ser. No. 102,165

Int. Cl.³ C10G *1/06, 47/08;* **B01J** *35/12*

U.S. Cl. 208—108 **3 Claims**

1. In a process for hydrocracking heavy aromatic polynuclear carbonaceous feedstocks to produce hydrocarbon fuels boiling below about 475° C. by contacting said feedstocks with hydrogen in the presence of a molten zinc chloride catalyst, thereafter separating at least a major portion of said hydrocarbon fuels from the spent molten zinc chloride catalyst, the improvement comprising; adjusting the $FeCl_2$ content of said molten zinc chloride to from about 2 to about 12 mol percent based on the mixture of said $FeCl_2$ and said molten zinc chloride.

4,257,874
PETROLEUM REFINERY PROCESSES USING CATALYST OF ALUMINOSILICATE SOLS AND POWDERS

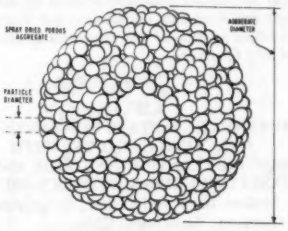
Horacio E. Bergna, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 861,397, Dec. 16, 1977, Pat. No. 4,217,240, which is a continuation-in-part of Ser. No. 809,362, Jun. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 719,717, Sep. 2, 1976, abandoned. This application Oct. 12, 1979, Ser. No. 84,404

Claims priority, application Canada, Aug. 31, 1977, 285851

Int. Cl.³ B01J *29/28*

U.S. Cl. 208—111 **3 Claims**



1. In a catalytic process for petroleum refining under conventional conditions, the improvement wherein the catalyst composition used comprises porous aggregates of spheroidal particles of from 3 to 90 nanometers which particles are nonporous to nitrogen and contain:

(a) a core of silica, aluminosilicate or one or more refractory metal oxides selected from alumina, zirconia, titania, thoria and rare earth oxides;

(b) a coating around said core of at least 0.5 nanometer in depth of an amorphous hydrous aluminosilicate compound having a molar ratio of Si:Al of from 1:1 to 19:1 and comprising one or more cations selected from sodium, potassium, ammonium, hydrogen and Groups 1 to VIII metals selected from Cs, Li, Mg, Ca, Sr, Ba, Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Y, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, La, Ce, rare earth metals, Hf, Ta, W, Re, Os, Ir, Pt, Au, Sn, Cd, Bi and Sb; and

(c) a surface layer over said coating of 0 to 15% by weight of a metal or metal oxide selected from Cs, Li, Mg, Ca, Sr, Ba, Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Y, Zr, Nb, Mo, Tc,

Ru, Rh, Pd, Ag, La, Ce, rare earth metals, Hf, Ta, W, Re, Os, Ir, Pt, Au, Sn, Cd, Bi and Sb; said power composition having a specific surface area of 30 to 750 m^2/g, a bulk density of 0.5 g/cc or more and substantially uniform size pore diameters of from 20 Å to to 250 Å, with pore diameters of 20 Å to 45 Å having a uniformity such that at least 90% of the pore volume is made up of pores of from 0.6 D to 1.4 D and pore diameters of 45 Å to 250 Å having a uniformity such that at least 80% of the pore volume is made of pores of from 0.6 D to 1.4 D, where D is the median pore diameter.

4,257,875

FLUID CATALYTIC CRACKING PROCESS

Robert A. Lengemann, Arlington Heights; Gregory J. Thompson, Waukegan, and Anthony G. Vickers, Arlington Heights, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 29, 1979, Ser. No. 43,527

Int. Cl.[3] C10G *11/18, 51/00*

U.S. Cl. 208—113 **1 Claim**

1. In a process for catalytically cracking in a reaction zone a hydrocarbonaceous feedstock having a distillate portion and a Conradson Carbon Number greater than about 1 and a vanadium and nickel heavy metal content of greater than about 2 ppm in the presence of a fluidizable cracking catalyst containing a heavy metal level comprising vanadium and nickel of greater than about 1000 ppm and which fluidizable cracking catalyst is deactivated by the deposition of coke deposits during said cracking, passed to a regeneration zone for reactivation of said fluidizable cracking catalyst by removal of said coke deposition and recycled after said reactivation to said reaction zone as the only catalyst to contact said feedstock, the improvement which comprises:

(a) passing a first portion of said reactivated catalyst in contact with said feedstock at a flow rate sufficient to raise the temperature of said feedstock to a temperature of 850°–1050° F. and thereby vaporize a part of the distillate portion of said feedstock; and

(b) passing a second portion of said reactivated catalyst to said reaction zone at a point distinct from said addition of step (a) to contact said first portion of said reactivated catalyst and feedstock containing said vaporized part of the distillate portion of said feedstock to effect the cracking of said feedstock.

4,257,876

PASSIVATION OF METALS CONTAMINATING A CRACKING CATALYST WITH TRIHYDROCARBYLANTIMONY OXIDE AND PROCESS FOR CONVERTING HYDROCARBONS

Dwight L. McKay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 926,694, Jul. 25, 1978, abandoned. This application Nov. 2, 1979, Ser. No. 90,839

Int. Cl.[3] C10G *11/05, 9/16, 37/14*

U.S. Cl. 208—120 **20 Claims**

1. A method for passivating a contaminant metal on a hydrocarbon cracking catalyst which comprises adding to said catalyst at least one trihydrocarbylantimony oxide.

4,257,877

SELECTIVE HYDROGENATION PROCESS

Rajinder K. Mahendroo, Fords, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Dec. 28, 1976, Ser. No. 754,991

Int. Cl.[3] C07C *15/02;* C10G *45/32, 45/44*

U.S. Cl. 208—144 **11 Claims**

1. A process for improving selective hydrogenation of unsaturated hydrocarbon compounds comprising initially contacting hydrogenation catalyst at a pressure in the range of from about atmospheric to about 1500 psig. in the absence of hydrogen at a temperature in the range of from about 40° C.–200° C. with a feedstock maintained in the liquid phase, said feedstock comprising (a) at least one unsaturated compound for which hydrogenation is intended in the process and at least one unsaturated compound which is intended to remain unsaturated, or (b) a compound having a first unsaturated portion which is intended to be hydrogenated in the process, and a second unsaturated portion which is intended to remain unsaturated, or (c) a mixture of (b) and an unsaturated compound which is intended to remain unsaturated, to improve the hydrogen selectivity of the catalyst, and thereafter contacting said catalyst with a mixture of said feedstock and hydrogen at conditions which effect hydrogenation of the unsaturated compound or portion thereof intended to be hydrogenated.

4,257,878

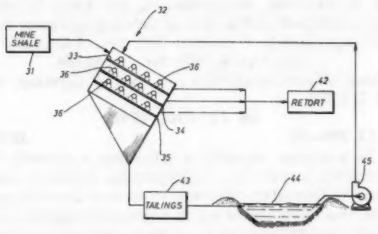
BENEFICIATION PROCESS FOR OIL SHALE

J. William Fishback, Arvada, and Dennis E. Petticrew, Denver, both of Colo., assignors to The Superior Oil Company, Houston, Tex.

Filed Apr. 12, 1979, Ser. No. 29,021

Int. Cl.[3] B03B *5/00;* C10G *1/00*

U.S. Cl. 209—2 **10 Claims**



1. A beneficiation process for oil shale ore containing cohesively bonded fine grained particles of clay and relatively larger particles of oil shale, comprising the steps of:

subjecting the oil shale ore to an aqueous medium;

agitating the oil shale ore in the presence of the aqueous medium to disintegrate at least a portion of the clay;

separating the disintegrated clay particles from the relatively larger remaining particles of oil shale; and

recovering the remaining oil shale.

4,257,879

PROCESS FOR DEWATERING COAL SLURRIES

Bernd Bogenschneider, Essen; Rolf Köhling, Bochum; Heinz Kubitza, Essen; Wilhelm Blankmeister, Essen, and Dieter Leininger, Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 9,698, Feb. 5, 1979, abandoned, which is a continuation of Ser. No. 843,781, Oct. 19, 1977, abandoned. This application Sep. 17, 1979, Ser. No. 76,504

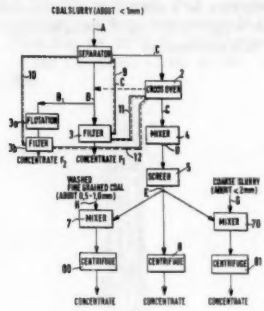
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2647554

Int. Cl.[3] B03B *9/00*

U.S. Cl. 209—5 **10 Claims**

1. A process for dewatering of coal slurries comprising separating a crude slurry into a slurry fraction containing predominantly relatively fine grain size particles and a slurry fraction containing predominantly relatively coarse grain size particles, said separating being effected at a size between about 0.03 and 0.15 mm grain size; adjusting said coarse grain fraction to contain about 15–30% of said fine grain sized material; subjecting the fine grain slurry fraction to a phase inversion treatment by contacting said particles with a hydrophobic

agent, whereby a mixture of agglomerated coal and of water containing a major portion of ash present in said fine grain



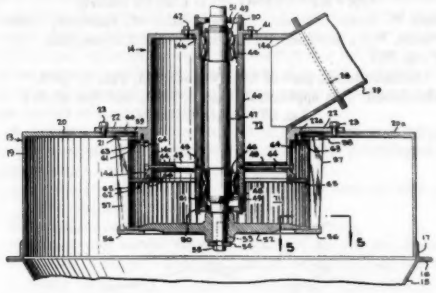
slurry fraction is formed; dehydrating said agglomerated coal; and subjecting said coarse grain size slurry to a dehydration.

4,257,880

CENTRIFUGAL AIR CLASSIFYING APPARATUS

Donald W. Jones, P.O. Box 1329, Sylacauga, Ala. 35150

Filed Jun. 28, 1979, Ser. No. 53,063
Int. Cl.[3] B07B *7/083*
U.S. Cl. 209—144 **4 Claims**



1. A centrifugal air classifying apparatus for use with a cyclone type centrifugal separator and a fan for drawing air from the cyclone separator and returning the same at superatmospheric pressure to the centrifugal classifying apparatus, comprising a main classifying rejector chamber having a rotary particle rejector in its upper portion supported for rotation about a vertical axis, means forming an expansion chamber below and communicating with the rejector chamber, means for supplying superatmospheric air from the fan to the expansion chamber to develop a rising and rotating column of air in the expansion chamber and in the rejector chamber outwardly surrounding the rotary particle rejector, the material to be classified being introduced directly into the air column in the zone of the rejector chamber outwardly surrounding the rotary particle rejector by feed conduit means, the rotary particle rejector being generally in the configuration of a cylindrical fan having a large number of vertically aligned blades about its circumference whereby air from the rising and rotating column of air in the rejector chamber outwardly surrounding the rejector flows through the spaces between the blades to a discharge chamber located inside the rejector carrying with it particles of material being thrown off the blades, means communicating with the discharge chamber for transfer of the separated fine particles from the discharge chamber to the cyclone collector, a first primary annular sealing ring inwardly adjacent the tops of the blades at the top of the rejector chamber providing a primary seal zone, and a secondary annular sealing ring extending from a boundary portion of said discharge chamber to a location closely adjacent the inner edges of the rejector blades at an intermediate location between the upper and lower ends of the blades providing a secondary seal zone.

4,257,881

PROCESS FOR BENEFICIATING OXIDE ORES

James K. Kindig, Arvada, and Ronald L. Turner, Golden, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 868,416, Jan. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 658,258, Feb. 17, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 921,583
Int. Cl.[2] C22B *1/00*
U.S. Cl. 75—1 R **60 Claims**

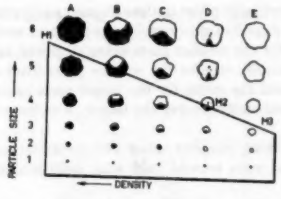
1. A process for beneficiating metal oxide ores selected from the group consisting of bauxite, apatite, and the metal oxides of Groups IIIB, IVB, VB, VIB, VIIB, VIIIB, IB, IIB and IVA which comprises contacting the metal oxide ore with a metal containing compound under conditions which cause the metal containing compound to react substantially at the surface of the metal oxide particles to the substantial exclusion of the gangue particles so as to alter the surface characteristics of the metal values thereby causing a selective enhancement of the magnetic susceptibility of the metal oxide values to the exclusion of the gangue in order to permit a physical separation between the values and the gangue.

4,257,882

METHOD OF PRE-CONCENTRATING HETEROGENEOUS MINERAL MIXTURES

Fredrik K. Mogensen, Hjo, Sweden, assignor to Kommanditbolaget Fredrik Mogensen & Co., Hjo, Sweden

Continuation-in-part of Ser. No. 680,139, Apr. 26, 1976, abandoned. This application Apr. 28, 1978, Ser. No. 901,240
Claims priority, application Sweden, May 16, 1975, 7505648
Int. Cl.[3] B03B *5/22*
U.S. Cl. 209—268 **1 Claim**



1. A method for dividing a heterogeneous collection of particles, which differ from one another in particle size and density, into groups differing in size and density comprising forming a dispersion of the particles in water and passing the dispersion downwardly through an overall space, said overall space having obstacles therein which are arranged such that the sizes of the spaces between the obstacles are always larger in size than the major number of particles arriving at said spaces and simultaneously agitating the water, whereby the particles are subject to variations in acceleration forces due to direct collision with other particles and the obstacles and movement of the water such that said varying acceleration forces change the path of said particles through said overall space, the change in path being

(a) less for a particle of equal size but greater weight than another particle, and

(b) less for a particle of equal weight but greater size than another particle, and

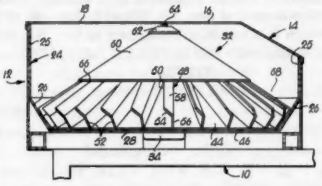
collecting the particles in different groups dependent upon said group path through said overall space.

4,257,883

PARTS SORTING MECHANISM

Steven P. Frazier, Tarsney Lakes, Mo., assignor to Realex Corporation, Kansas City, Mich.

Filed Feb. 12, 1979, Ser. No. 11,323
Int. Cl.³ B07B *13/05*
U.S. Cl. 209—664 **10 Claims**



1. Mechanism for sorting relatively larger parts from relatively smaller parts including:

a rotor having an upright axis of rotation; means defining a radially outwardly extending, downwardly sloping upper surface of said rotor,

said upper surface being adapted to receive a mixture of both parts and to feed the same by gravity in a radially outward and downward direction,

said rotor being provided with means permitting only the smaller parts to pass from said upper surface during said feeding of the mixture;

means defining a radially outwardly extending, downwardly sloping lower surface disposed below said upper surface in disposition to receive the smaller parts gravitating from the upper surface,

said lower surface being adapted to feed the smaller parts by gravity in a radially outward and downward direction;

a wall adjacent the radially outer terminations of said surfaces for preventing escape of the parts from the rotor; and

a pair of vertically offset outlets for said parts situated adjacent the radially outer terminations of said surfaces,

the outlet for the smaller parts being disposed at a level to gravitationally receive the smaller parts from said lower surface and the outlet for the larger parts being disposed to gravitationally receive the larger parts from said upper surface,

said rotor being adapted when rotated about said axis to drive the parts around said wall until said outlets are reached,

said upper surface defining means including a series of elongated members positioned around said axis with their upper longitudinal, part-engaging extremities substantially defining elements of a cone having its apex on said axis, said members being laterally spaced apart to present perforations in the upper surface through which the smaller parts may pass to the lower surface.

4,257,884

CHROMATOGRAPHY

Franklin Lim, Richmond, Va., assignor to Damon Corporation, Needham Heights, Mass.

Filed Apr. 17, 1979, Ser. No. 30,848
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—656 **12 Claims**

1. A chromatographic device for separation of solutes of differing molecular dimensions, said device comprising,

a mass of microcapsules

having polymeric membranes characterized by an upper limit of permeability greater than the diameter of at least one solute to be separated, and

containing a solution of a material capable of maintaining the membranes in a distended position and having a molecular weight in excess of the upper limit of permeability of said membranes

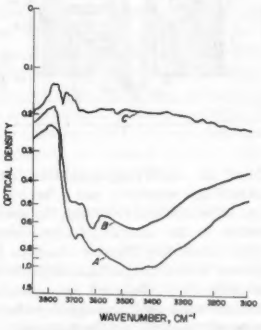
said microcapsules being disposed within means defining a flow path so that said mixture of solutes may be passed therealong in contact with said microcapsulse to result in at least one zone rich in a subset of said solutes.

4,257,885

NOVEL ZEOLITE COMPOSITIONS AND PROCESSES FOR PREPARING AND USING SAME

Robert W. Grose, Mobile, Ala., and Edith M. Flanigen, White Plains, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 655,065, Feb. 4, 1976, abandoned. This application Aug. 6, 1979, Ser. No. 63,961
Int. Cl.³ B01D *15/00*
U.S. Cl. 210—691 **16 Claims**



1. A synthetic crystalline zeolitic molecular sieve having a chemical composition expressed in terms of moles of oxides of

$$0.8\text{–}3.0\ M_2O : Al_2O_3 : 10\text{–}100\ SiO_2 : 0\text{–}40\ H_2O$$

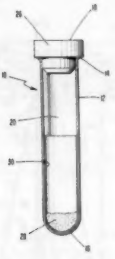
wherein M represents a metallic cation and n represents the valance of M, and having an X-ray powder diffraction pattern having at least the d-spacings set forth in Table I, said zeolitic molecular sieve after being calcined in air at a temperature of 600° C. having an infrared spectrum exhibiting substantially no absorption within the rainge of 3600–3100 cm^{-1}.

14. Process for removing organic molecules from admixture with water molecules which comprises contacting said mixture with the zeolitic molecular sieve composition of claim **1**, whereby the organic molecules are selectively adsorbed on said molecular sieve.

4,257,886
APPARATUS FOR THE SEPARATION OF BLOOD COMPONENTS

Stephen B. Kessler, North Bergen, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Jan. 18, 1979, Ser. No. 4,450
Int. Cl.³ B01D *12/00, 43/00*
U.S. Cl. 210—516 **9 Claims**



1. An assembly for use in the centrifugal separation of heavy and light phases from blood, said assembly comprising: a blood container having therein a body of barrier material which is chemically and physically inert to the separated phases of blood and capable of forming a transverse barrier between the heavier and lighter phases of blood upon centrifugation, the portion of the inner surface of the container which is adjacent to the transverse barrier formed by the barrier material upon centrifugation being hydrophobic so as to provide an improved seal between the container surface and the barrier due to the adherence of said barrier material to said hydrophobic portion of said inner surface to ensure against migration across the barrier of separated blood phases.

6. An assembly for use in the centrifugal separation of heavy and light phases from blood, said assembly after centrifugation comprising:

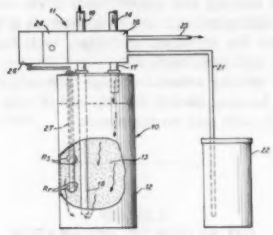
a. a tubular container having a glass body formed with an open end and a closed end;
b. a closure hermetically sealing said open end;
c. a transverse barrier between separated heavier and lighter phases of blood within the tubular container, said barrier being chemically and physically inert to the separated phases of blood; and
d. a hydrophobic, water-insoluble coating fixed to the inner surface of the tubular container so as to prevent migration thereof along said surface, said coating being positioned adjacent said barrier such that an improved seal is provided between said separated phases of blood due to the adherence of said barrier material to said hydrophobic coating.

4,257,887
CIRCUIT AND APPARATUS FOR CONTROLLING A WATER SOFTENER

Stanley F. Rak, Mundelein, and Donald P. DeVale, Sycamore, both of Ill., assignors to Culligan International Company, Northbrook, Ill.

Filed Sep. 26, 1979, Ser. No. 79,072
Int. Cl.³ B01J *49/00*
U.S. Cl. 210—96.1 **6 Claims**

2. Apparatus for regenerating the ion exchange bed of a water softener having a regenerating means and a recycling control connected to control the regenerating means comprising, two pairs of spaced electrodes and at least one mounted in the ion exchange bed, a bridge circuit including said pair of electrodes, an A.C. power supply signal applied to said bridge circuit, a first comparator receiving a first input from said bridge circuit, a reference signal supplied to said first comparator, a relay with switch contacts operated by said first comparator, a latching circuit connected to said relay to maintain it energized, a timing means capable of being set to selected time periods, and a recycle switch controlled by said timing means and said recycle switch and the switch contacts of said relay connected in circuit with said recycling control including a reset switch connected to said latching circuit for resetting it

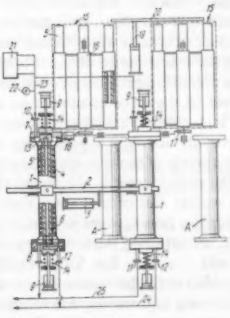


and wherein said reset switch is controlled by said timing means to reset said latching circuit after said ion bed has been regenerated and including a time delay circuit connected between said first comparator and relay so that said relay is operated only if the output of said first comparator indicates that regeneration should occur for a fixed time period.

4,257,888
CARTRIDGE FILTER

Boris B. Kudryavtsev, ulitsa Menzhinskogo, 21, kv. 227, Moscow; Valentin P. Krasnokutsky, Novo-uglichskoe shosse, 65, kv. 51, Zagorsk; Lev A. Fedotov, ulitsa A. Dikogo, 5, korpus 2, kv. 15, Moscow; Semen F. Sholk, Zvenigorodskoe shosse, 3-a, kv. 223, Moscow; Jury R. Svidler, Znamenskaya ulitsa, 35, kv. 22, Moscow; Ivan V. Zhigarev, ulitsa Kostanaevskaya, 40, kv. 4, Moscow; Nikolai N. Begunov, Izmailousky bulvar, 9, kv. 40, Moscow; Valentin F. Kostylev, Zvenigorodskoe shosse, 3-a, kv. 243, Moscow; Jury M. Brodsky, Sevastopolsky prospekt, 83, korpus 1, kv. 49, Moscow, and Vadim A. Knyazev, Leninsky prospekt, 72, kv. 239, Moscow, all of U.S.S.R.

Filed May 1, 1979, Ser. No. 35,063
Int. Cl.³ B01D *27/00*
U.S. Cl. 210—97 **10 Claims**



1. A cartridge filter comprising:

a movable housing whose interior surface defines a filter compartment formed as an elongated cavity open at both ends for accommodating filtering cartridges;
means for replacing cartridges positioned in said cavity with fresh cartridges, said replacing means being in spaced relationship with said filter compartment;
means for moving said housing from an initial position to

said means for replacing and for returning said housing to the initial position;

movable cover means for closing the cavity ends mounted externally of said movable housing;

pipe means connected to said cover means for charging and discharging fluid to be filtered into or from the filter compartment;

means for moving and bringing said cover means into and out of sealing engagement with the ends of said cavity;

said means for replacing cartridges including means for storing fresh cartridges; and

means for moving a fresh cartridge from said storing means to said housing cavity, the top end of said cavity being alignable with said storing means.

4,257,889

OIL SKIMMING APPARATUS

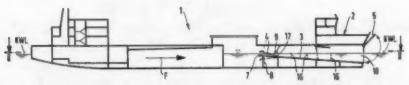
Wolfram Wöber; Dirk Franzius; Gerd Andersson; Klaus Jung, all of Hamburg; Peter Suess, Buxtehude, and Claus Wagner, Henstedt-Ulzburg, all of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Feb. 26, 1980, Ser. No. 124,753

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2908030

Int. Cl.[3] **E02B** *15/04*

U.S. Cl. 210—104 **5 Claims**



1. Apparatus for skimming oil from the surface of a body of water comprising a ship having a bow, a stern and a water line, a flap displaceably mounted on the bow of said ship for forming an opening into the interior thereof with the opening extending from above to below the water line, said opening arranged to receive a mixture of oil and water from the surface of the body of water on which said ship travels, a ramp located within said ship and extending from the lower end of the opening in the bow toward the stern with said ramp being inclined upwardly in the direction toward the stern, a collecting tank located within said ship at the end of said ramp closer to the stern, said collecting tank arranged to provide a separation of the mixture of oil and water so that the oil can be stored in the ship and the water can be directed back into the body of the water, wherein the improvement comprises that the end of said ramp closer to the stern comprises an overflow flap extending in the bow-stern direction and having a first end closer to the bow pivotally attached to said ramp about a pivot axis extending transversely of the bow-stern direction and a second end closer to the stern located in the region above said collecting tank, said second end of said ramp forming an overflow edge for the mixture passing over said overflow flap into said collecting tank, an adjusting device mounted in said ship and connected to said overflow flap for pivotally displacing said overflow flap relative to the remainder of said ramp and for vertically positioning said second end relative to said collecting tank, and means connected to said adjusting device for controlling the position of said overflow flap, said controlling means comprising a plurality of sensing elements each arranged to check a factor affecting flow of the mixture over said ramp into said collecting tank, and said plurality of sensing elements comprising a first said sensing element arranged to check the level of flow over said second end of said overflow flap relative to the remainder of said ramp through the medium of said adjusting device.

4,257,890

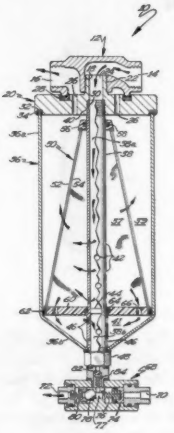
FUEL-WATER SEPARATOR

Erwin E. Hurner, 2605 S. Rivershore Dr., Moorhead, Minn. 56560

Filed Jul. 25, 1979, Ser. No. 60,622

Int. Cl.[3] **B01D** *35/02, 35/18*

U.S. Cl. 210—112 **2 Claims**



1. A fuel-water separator for use with diesel fuel, said separator comprising:

an inlet chamber for receiving fuel;

an outlet chamber;

a separation screen means having first and second faces facing said inlet chamber and said outlet chamber respectively, said screen means for passing only diesel fuel therethrough while preventing the passage of water, said screen means first face facing generally downwardly such that water, sediment and the like will fall away from said first face, said screen means having a downwardly diverging frustroconical shape;

a cylindrical housing having top and bottom ends, said separation screen means being located in said housing and extending from said top end to said bottom end, said inlet chamber being inside said screen means and said outlet chamber being located between said screen means and said housing;

a bottom plate, said bottom plate having aperture means therein, the cross sectional area of said aperture means being small relative to the total area of said plate, said plate being located above said housing bottom end and in sealing relationship to the bottom of said screen means and said housing;

a hollow cylindrical core member having a top and bottom, the interior of said core member being connected at said core top to a source of fuel to be cleaned, said core member being located inside of and coaxial with said housing and said screen means and extending at least the length of said screen means, said core member having a plurality of radially directed apertures therethrough above said bottom plate, said apertures being located in the bottom half of the portion of said core in said housing, the top half of said core being impervious to the passage of fluids;

a quiet zone located beneath said bottom plate and in communicaton with said inlet chamber by said aperture means;

means for generating a periodic signal

means for draining water from said quiet zone, said means being responsive to said periodic signal; and

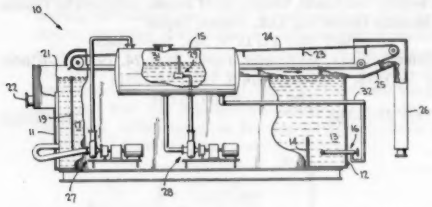
an outlet passage in communication with said outlet chamber.

4,257,891

DUAL DISC PRESSURE RELEASE VALVE

Arthur R. Albohn, Whippany, N.J., assignor to Komline-Sanderson Engineering Corp., Peakpack, N.J.

Filed Sep. 26, 1979, Ser. No. 78,957
Int. Cl.³ C02C *1/10*
U.S. Cl. 210—221.2 **10 Claims**



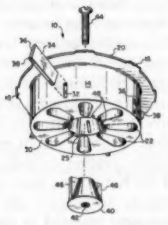
1. In a flotation unit having a pressure reducing control valve assembly for supplying a flotation tank with an aeration fluid stream, the improvement wherein said valve assembly comprises an elongated inlet tube of a predetermined inner diameter, a fixed annular valve plate extending transversely at a terminal end of said tube and having an axial opening, a transversely extending imperforate disc valve movable toward and away from an outer surface of said valve plate respectively between valve closing and valve opening positions, said disc valve having an inner surface overlapping with said outer surface to define a valve land width, which establishes the length of a shear zone across which a pressure drop occurs, and means supporting said valve disc for axially shifting said disc to adjust the extend of said valve opening position, the ratio of the extend of said valve opening position to said land width being not greater than 1.0, whereby a predetermined size of air bubbles is controlled by said shear zone within which the fluid stream is intensely turbulent for a predetermined short period of time thereby causing air bubbles to form and then be discharged into liquid within said tank without having had time to coalesce.

4,257,892

DRAIN COVER

Donald J. Boersma, 18610 S. John Ave., Country Club Hills, Ill. 60477

Filed Dec. 19, 1979, Ser. No. 105,156
Int. Cl.³ E03F *1/00*
U.S. Cl. 210—163 **8 Claims**



1. A drain cover of the character described comprising:
a cylindrical body adapted to be readily inserted into a drain pipe;
a top disc of larger diameter than said cylindrical body and adapted to engage the top surface of the floor surrounding a drain pipe;
draining openings formed in said disc and cylindrical body;
adjustable locking means carried by said cylindrical body;
wall means in said cylindrical body isolating said locking means from said drainage openings; and
means associated with said body for selectively moving said locking means into locking engagement with a drain pipe wall, and being manually operable from above said disc when the drain cover is operationally positioned.

4,257,893

PORTABLE PURIFICATION DEVICE FOR USE IN AQUARIUMS

Todd J. Burton, 147½ Seibert Rd., Pittsburgh, Pa. 15237

Filed Apr. 4, 1979, Ser. No. 27,079
Int. Cl.³ E04H *3/20*
U.S. Cl. 210—169 **1 Claim**

1. A portable purification apparatus for use in an aquarium tank, or the like, comprising: a housing defining a substantially closed filter chamber with a water tube column extending from a bottom portion of said chamber through an opening in a top portion thereof, said water tube having a first opening located in the bottom portion of said chamber and a second open end located above the top of the housing portions defining said chamber, means for discharging compressed air within said tube column at a point relatively near said first opening end thereof, a pickup tube having one receiving opening disposed beneath the bottom portion of said chamber and a second opening located within said chamber in an upper portion thereof, air outlet means in the top of said chamber and a water discharge outlet in a lower portion of the housing defining said chamber, polyester type filtering material located within said chamber between said water tube first opening and said second water tube opening, and filter chamber removable means for facilitating replacement of the filter material in said filter chamber.

4,257,894

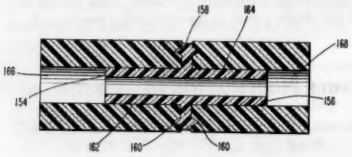
FILTER CORE EXTENDER AND SEAL

Marshall Barney, Columbus, Ohio, assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 2, 1978, Ser. No. 957,123
Int. Cl.³ B01D *25/00, 27/00*
U.S. Cl. 210—232 **8 Claims**

1. In combination with a cartridge filter having a longitudinal bore, a cartridge filter core extender for insertion into the bore, the core extender comprising a core extender body having first and second ends with communication means extending longitudinally through said body between the first and second ends, a shoulder extending generally radially from the body and axially spaced from each end, a first external surface extending between the first end and the shoulder, a second external surface extending between the second end and the shoulder, the diameter of said radially extending shoulder being greater than the diameter of the longitudinal bore of the car-

tridge filter, said first external surface defining a portion of said core extender which is inserted into the longitudinal bore of the cartridge filter and is of such a dimension so as to prevent



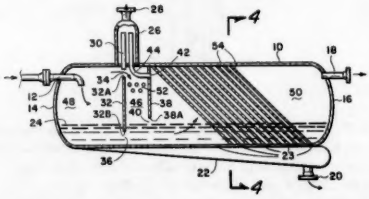
the passage of fluid between the external surface of the extender and the body of the filter, the radially extending shoulder being pressed against an end surface of said cartridge filter and said core extender being spin welded to said cartridge filter.

4,257,895

LOW GRAVITY CRUDE OIL AND WATER SEPARATOR

Forrest L. Murdock, P.O. Box 9635, Tulsa, Okla. 74107

Filed May 8, 1979, Ser. No. 37,155
Int. Cl.³ B01D *17/06*
U.S. Cl. 210—243 **8 Claims**



1. An apparatus for separating oil and water from an emulsion comprising:

a horizontal vessel having an emulsion inlet adjacent the first end and an upper oil outlet and a lower water outlet adjacent the second end;

means of maintaining a level of water of selected depth in the vessel;

a first vertical baffle in the vessel intermediate the ends;

a second vertical baffle in the vessel parallel to and spaced from the first baffle in the direction towards the vessel second end, the baffles being arranged so that emulsion flowing from the first towards the second end of the vessel flows vertically between the baffles, the area of the vessel between the first end and the first baffle forming a quiescent zone, and the areas of the vessel between the second baffle and the vessel second end forming a separating zone;

an electric grid system traversing the areas between said baffles, the grid system including electric grids spaced in horizontal layers and arranged such that emulsion passing between said baffle passes vertically through successive horizontal layers of the grid system;

means of imparting an electric potential to said grid system whereby an electric field is established through which emulsion flows as it passes from said quiescent zone to said treating zone;

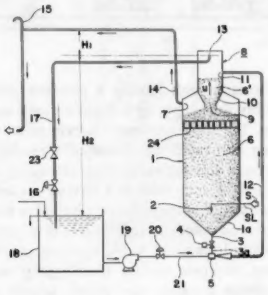
a plurality of spaced apart paralleled metal separator screens positioned within said vessel treating zone arranged such that fluid flowing through the treating section towards said oil outlet flows through said screens, each separator screen being a planar foraminous reticulum of integrally formed relatively small width and small thickness strands all of which are longitudinally downwardly inclined providing a multiplicity of continuous uninterrupted downwardly inclined paths on which water components may travel towards the bottom of the vessel for discharge out said water outlet.

4,257,896

COUNTERCURRENT LIQUID-SOLID CONTACTING APPARATUS

Yorifumi Ikeda, Osaka; Akira Nakatani, Amagasaki, and Yasuhiro Tsujimoto, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed May 17, 1979, Ser. No. 40,083
Claims priority, application Japan, May 24, 1978, 53-62640; May 26, 1978, 53-63505; Feb. 5, 1979, 54-12516
Int. Cl.³ B01D *23/10*
U.S. Cl. 210—268 **13 Claims**



1. An apparatus for purifying a liquid by the counter-current liquid-solid contact and for regenerating a treatment material used to purify the liquid, which comprises, in combination:

a liquid treating column having a bed of particles of treatment material therein, said liquid treating column also having treatment material inlet and outlet means at its top and bottom, respectively, and liquid inlet and outlet means at respective lower and upper portions thereof, said liquid inlet means being positioned above the material outlet means and adapted to be connected to a source of the liquid to be purified;

a regenerating column having its top end closed to the atmosphere and its bottom end extending into the liquid treating column through the material inlet means and having an unvalved lower opening into said liquid treating column, said regenerating column having therein a mass of particles of the same treatment material as that in the liquid treating column, the treatment material in the regenerating column being contiguous to the treatment material in the liquid treating column through said lower opening, said regenerating column further having an exhaust port opening out of the regenerating column;

a material discharge pipe having one end connected to the material outlet means and having a shut-off valve therein, said shut-off valve being adapted to be opened to allow successive portions of the treatment material adjacent the bottom of the liquid treating column to flow by gravity into the material discharge pipe while the treatment material bed consequently descends in the liquid treating column and the treatment material in the regenerating column flows by gravity into the liquid treating column to compensate for the reduction in the amount of the treatment material in the liquid treating column;

a transport pipe having one end connected to the interior of the regenerating column;

transfer means connected between the respective other ends of the material discharge pipe and the transport pipe for moving the particles of treatment material discharged into the material discharge pipe during the time the shut-off

valve is open back to the regenerating column through the transport pipe;

a liquid discharge pipe having one end connected to the liquid outlet means for discharging the purified liquid to the outside of the liquid treating column;

an exhaust pipe having one end connected to the exhaust port in the regenerating column; and

liquid seal means at the other end of said exhaust pipe for sealing the exhaust pipe from the atmosphere, said liquid seal means being at a position spaced vertically a predetermined distance from and below the level of the opening of the exhaust port, whereby suspended solids which have been separated from the particles of the treatment material fed back into the regenerating column and which are contained within liquid in the regenerating column are discharged from the regenerating column.

4,257,897

PROCESS FOR REABSORPTION AND RETENTION OF PHOSPHOROUS BY ACTIVATED BIOMASS

David J. Krichten, Allentown, and David M. Nicholas, New Tripoli, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 26, 1979, Ser. No. 88,664
Int. Cl.[3] C02C *1/06, 1/17*
U.S. Cl. 210—605 **5 Claims**

1. A process for promoting the return to and retention by a biomass of phosphorous previously contained by the biomass and released under anaerobic conditions into a liquid medium in admixture with the biomass, the liquid medium having a COD concentration of at least about 100 milligrams per liter, which process comprises subjecting the mixture to treatment under aerobic conditions selected so as initially to maintain a DO content in the range from greater than 3.0 to about 30 mg/l, while there is an increasing pH in the mixture, and when the pH of the mixture ceases to increase, then maintaining a second DO content in the range from less than 3.0 to about 0.5 mg/l.

4,257,898

METHOD OF PROCESSING WASTE SLUDGE FROM WET PHOSPHORIC ACID PURIFICATION FACILITIES

Peter Meurer, Herdecke-Ende; Martin Hater; Fritz Meininghaus, both of Dortmund, and Rüdiger Scheel, Schwerte, all of Fed. Rep. of Germany, assignors to Uhde GmbH, Dortmund, Fed. Rep. of Germany

Filed Dec. 3, 1979, Ser. No. 99,530
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854433
Int. Cl.[3] C02F *1/00*
U.S. Cl. 210—751 **6 Claims**

1. A method of converting a waste sludge of substantially no utility from wet phosphoric acid purification, having a relatively high, water-soluble phosphatic content and containing other environmental-polluting components, to a useful fertilizer, said method comprising contacting said sludge with steelworks slag having a relatively low phosphatic content, forming a fertilizer admixture from said sludge and slag having an averaged phosphatic content depending on the relative proportions of sludge and slag used, and reducing the concentration of said other environmental-polluting components to a non-polluting, permissible value.

4,257,899

METHOD FOR REMOVING CHLOROPICRIN FROM AN AQUEOUS MEDIUM

Jon A. Orvik, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 10, 1979, Ser. No. 73,778
Int. Cl.[3] C02F *1/72*
U.S. Cl. 210—758 **4 Claims**

1. A method for destroying chloropicrin in an aqueous medium contaminated with chloropicrin which comprises contacting the aqueous medium with a sufficient amount of an alkali metal sulfite at a pH of from about 6 to 14 for a sufficient period of time to render the aqueous medium substantially free of chloropicrin.

4,257,900

METHOD OF CLARIFYING LIQUIDS

Harold R. White, New Lenox, and Alexander J. Doncer, Jr., Palos Heights, both of Ill., assignors to Alar Engineering Corporation, Chicago, Ill.

Division of Ser. No. 15,463, Feb. 26, 1979, Pat. No. 4,193,871. This application Jul. 13, 1979, Ser. No. 57,212
Int. Cl.[3] B01D *21/24*
U.S. Cl. 210—776 **9 Claims**

1. The method of clarifying liquid suspensions of solids which comprises continuously flowing the suspension into one end of a longitudinally elongated settling tank, continuously settling solids from the liquid along the longitudinal length of the tank, continuously collecting the settled solids in a plurality of localized zones along the length of the bottom of the tank, continuously overflowing clarified liquid from the end of the tank opposite the end receiving the suspension, suspending a separate suction removal means in each localized zone, reciprocating the suction removal means in opposite directions only in the zone in which it is suspended and parallel with the direction of flow of the liquid, separately sucking the solids from each zone progressively along the length of the zone, sequentially actuating the separate sucking operations in a timed relationship to increase the progressive sucking operations in the zones receiving the heavier solids over the sucking operations in the zones receiving the lighter solids to maintain settling of the solids along the length of the tank, and limiting the progressive sucking operations to short strokes within said zones.

4,257,901

CLEANABLE FILTER AND METHOD OF CLEANING SAME

Willard E. Rapp, Griggstown, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Aug. 13, 1979, Ser. No. 65,808
Int. Cl.[3] B01D *23/24*
U.S. Cl. 210—791 **12 Claims**

1. A filter assembly comprising:

(a) a housing for supporting a filter therein;

(b) a filter supported within said housing and having a flat surface upon which debris accumulates during filtration, said surface capable of being cleaned in situ without substantial wear by scraping said surface;

(c) movable filter cleaner means mounted within said housing, a part thereof extending beyond said housing and having a plurality of spaced apertures for accummulation therein of debris failing to pass through the filter when such aperture is in alignment with said filter, one surface of the filter cleaning means being juxtaposed to the surface of the filter to be cleaned such that movement of the filter cleaning means causes the edge of the aligned aperture to scrape debris from the filter surface as it moves out of alignment, the spacing of said apertures being such that a clean aperture comes into alignment with the stationary filter as the aperture previously in alignment therewith is moved out of alignment thereby cleaning the filter, removing the accumulated debris from the housing and providing a clean aperture in alignment with the filter; and

(d) means for cleaning the accumulated debris from the apertures subsequent to moving the apertures out of alignment with said filter.

4,257,902

WATER-BASED INDUSTRIAL FLUIDS

Haimi N. Singer, Sandton, South Africa, assignor to Singer & Hersch Industrial Development (Pty.) Ltd., Sandton, South Africa

Filed Jul. 27, 1977, Ser. No. 819,724

Claims priority, application South Africa, Aug. 4, 1976, 76/4685; Sep. 28, 1976, 76/5792; Sep. 28, 1976, 76/5793; Sep. 28, 1976, 76/5794; Nov. 26, 1976, 76/7076; Nov. 26, 1976, 76/7077; Feb. 21, 1977, 77/1013

Int. Cl.[3] C10M *3/40, 3/34, 3/06, 3/04*

U.S. Cl. 252—18 27 Claims

1. A substantially oil-free aqueous composition of matter useful as a lubricant or functional liquid comprising (A) a major amount of water including up to as much as 99.9 percent by weight of water, (B) a minor amount of at least one substantially water-insoluble, oil-soluble functional additive stably dispersed therein, wherein the functional additive (B) is a sulfur- or chlorosulfur-containing E.P. agent or mixture of two or more of these, (C) a minor amount of at least one substantially water-soluble, liquid organic dispersing agent, said dispersing agent being capable of stably dispersing said functional additive in said aqueous composition and wherein (D) at least one water-soluble polymeric thickener for said aqueous composition is present.

4,257,903

DRILLING FLUID CONTAINING CROSSLINKED POLYSACCHARIDE DERIVATIVE

Clare H. Kucera, and Donald N. DeMott, both of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 19, 1978, Ser. No. 952,875

Int. Cl.[3] C09K *7/02*

U.S. Cl. 252—8.5 C 16 Claims

1. An improved drilling fluid comprising an aqueous solution of a gelling amount of a hydroxyalkyl galactomannan crosslinked with a water soluble alkali metal aluminate.

4,257,904

DIELECTRIC GLASS COATING COMPOSITION CONTAINING POLYMETHYLMETHACRYLATE FUGATIVE BINDER

Leslie C. Anderson, Kingston, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,151

Int. Cl.[3] H01B *3/02*

U.S. Cl. 260—33.2 R 11 Claims

1. A mixture to be used in coating a substantially uncontaminated dielectric glass film onto a subtrate consisting essentially of the following ingredients in the following proportions:

Constituents	Percent by Weight
linear polymethylmethacrylate	4.7–39.7
plasticizer	0.0–9.1
dielectric glass having a melting point above approximately 375° C.	60.3–93.0

4,257,905

GASEOUS INSULATORS FOR HIGH VOLTAGE ELECTRICAL EQUIPMENT

Loucas G. Christophorou, Oak Ridge; David R. James; Marshall O. Pace, both of Knoxville, and Robert Y. Pai, Concord, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 830,973, Sep. 6, 1977, Pat. No. 4,175,048. This application May 31, 1979, Ser. No. 44,787

Int. Cl.[3] H01B *3/56*

U.S. Cl. 252—571 1 Claim

1. A method for designing a multicomponent gaseous insulator comprising determining the attachment cross section of candidate gases for electrons having energies in the range of 0–1.3 eV; selecting as a first component a gas having an electron attachment cross section greater than 10^{-16} cm^2; selecting as a second comonent a gas from the group of N_2, H_2, CO and CO_2; and mixing said first and second components.

4,257,906

METHOD OF PROTECTING NITRILOTRIACETATE SALTS

Marvin M. Crutchfield, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 14, 1980, Ser. No. 112,005

Int. Cl.[3] C11D *7/60*

U.S. Cl. 252—99 12 Claims

1. A method of protecting trialkali metal nitrilotriacetate from active chlorine in aqueous solution which comprises adding to the nitrilotriacetate, before contact with active chlorine in solution, a sufficient amount of trialkali metal imidodisulfate to protect at least some of the nitrilotriacetate from active chlorine damage.

6. A machine dishwashing formulation comprising:

(A) from about 0.5 to less than about 5 percent by weight of a surfactant selected from the group consisting of low-foaming anionic and nonionic surfactants and mixtures thereof;

(B) an active chlorine-providing material selected from the group consisting of potassium dichlorocyanurate, sodium dichlorocyanurate, [(mono-trichloro)tetra(monopotassium dichloro)]pentaissocyanurate, (mono-trichloro)(mono-potassium dichloro)diisocyanurate and chlorinated trisodium phosphate, said active chlorine-providing material constituting from about 10 to about 30 percent by weight of the formulation when said material is chlorinated trisodium phosphate and from about 0.5 to about 5 percent by weight of the formulation when said material is a chlorocyanurate; and

(C) from about 20 percent to about 90 percent of a mixture of trialkali metal nitrilotriacetate and trialkali metal imidodisulfate in a weight ratio between about 2:1 and 1:2.

4,257,907

DISINFECTANT CLEANING COMPOSITIONS

Robert P. Langguth, Overland, and Kathie J. Tryson, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 21, 1979, Ser. No. 41,267

Int. Cl.[3] C11D *3/48, 1/22*

U.S. Cl. 252—106 8 Claims

1. An aqueous composition comprising:

(a) from about 0.03 percent to about 20 percent by weight ortho-benzyl-para-chlorophenol;

(b) from about 1.0 to about 2.5 parts by weight, per part by weight of Component (a), of an alkali metal salt of an alkyl naphthalene sulfonic acid, or mixtures thereof;

(c) from about 0.03 to about 1.5 parts by weight, per part by weight of Component (a), of a sulfobetaine surfactant;

(d) from about 0.2 to about 0.5 parts by weight, per part by weight of Component (c), of an anionic surfactant which is a C_{10}–C_{18} alkyl sulfate or mixtures thereof:

(e) from about 0.02 to about 0.05 parts by weight, per combined parts by weight of Components (b), (c) and (d), of a detergency boosting acrylic copolymer.

4,257,908

LAUNDRY DETERGENT IN GEL FORM

Harold E. Wixon, New Brunswick, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 603,599, Aug. 11, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,475

Int. Cl.[3] C11D 3/065

U.S. Cl. 252—135 11 Claims

1. A concentrated detergent composition in the form of a translucent, stable, single phase gel comprising by weight (A) from about 5 to 40 parts of an anionic detergent comprising a, polyoxyalkylenated C_{10}–C_{22} alcohol sulfate containing from about 1 to 6 moles of combined alkylene oxide, the ratio of the number of carbon atoms in said alcohol to the number of combined alkylene oxide being from about 2:1 to 5:1, (B) from about 25 to 55 parts of potassium pyrophosphate, and from about 30 to 50 parts of solvent medium comprising water and water miscible alcoholic solvent, (A), (B) and (C) totalling 100 parts.

4,257,909

NON-AROMATIC HYDROCARBON CONTAINING CLEANING FLUID

Erik F. S. Christianson, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation-in-part of Ser. No. 87,630, Oct. 23, 1979, which is a continuation of Ser. No. 942,764, Sep. 15, 1978, abandoned. This application Dec. 28, 1979, Ser. No. 108,451

Claims priority, application Denmark, Sep. 26, 1977, 04235/77

Int. Cl.[3] C11D 1/71, 1/825, 7/50

U.S. Cl. 252—170 3 Claims

1. In a cleaning fluid consisting essentially of a liquid hydrocarbon and a small amount of an alkyl-or alkaryl-ethoxylate as a wetting agent, the improvement which comprises utilizing as the hydrocarbon a liquid hydrocarbon which is substantially free from aromatic components and incorporating into the composition, as a linking agent for the hydrocarbon and the wetting agent, from 3 to 8 percent by weight, based on the total weight of the composition, of a diester of a monoglyceride of a saturated or unsaturated fatty acid containing from 8 to 18 carbon atoms and in which the esterifying groups are selected from acetate, propionate and butyrate.

4,257,910

LIQUID CRYSTAL OF DIESTER TYPE EXHIBITING A SMECTIC PHASE, WITH LOW FREQUENCY OF DIELECTRIC ISOTROPY, AND DISPLAY DEVICE UTILIZING THIS CRYSTAL

Alain Beguin; Annie Zann, and Jean-Claude Dubois, all of Paris, France, assignors to Thomson-CSF, Paris, France

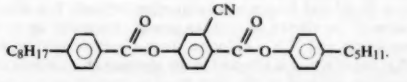
Filed Mar. 13, 1979, Ser. No. 20,056

Claims priority, application France, Mar. 17, 1978, 78 07799

Int. Cl.[3] C09K 3/34; G02F 1/13

U.S. Cl. 252—299 3 Claims

1. A liquid crystal of the diester type having the chemical formula



4,257,911

LIQUID CRYSTAL MATERIALS

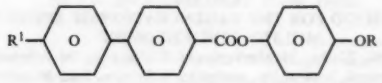
George W. Gray, Cottingham, and Damien G. McDonnell, Hull, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 948,774, Oct. 5, 1978, abandoned, which is a continuation of Ser. No. 822,342, Aug. 5, 1977, abandoned. This application Jul. 27, 1979, Ser. No. 61,243

Int. Cl.[3] C09K 3/34; G02F 1/13

U.S. Cl. 252—299 19 Claims

1. A liquid crystal material containing a plurality of compounds at least one of which is a cholesteric liquid crystal compound having a molecular helical pitch length of the order of 0.2 μm, wherein the improvement comprises the said cholesteric compound being an ester having the formula



wherein R^1 is a branched alkyl group having a chiral center and R is an alkyl group having 1 to 10 carbon atoms with the proviso that the racemates of said at least one cholesteric ester compound are excluded from the liquid crystal material.

4,257,912

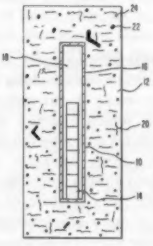
CONCRETE ENCAPSULATION FOR SPENT NUCLEAR FUEL STORAGE

Leonard R. Fleischer, Mt. Lebanon, Pa., and Muthian Gunasekaran, Woodland Hills, Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 12, 1978, Ser. No. 914,828

Int. Cl.[2] G21F 9/36, 5/00

U.S. Cl. 252—301.1 W 8 Claims



1. A system for fixed storage of spent nuclear fuel having activated fission products contained within a metallic fuel rod housing, comprising: a uniform concrete contiguously and completely surrounding said housing having metallic fibers to enhance thermal conductivity and polymers to enhance impermeability and means for convectively cooling the exterior surface of said concrete.

4,257,913

STABLE MANGANESE SALT SOLUTIONS AND A PROCESS FOR THEIR PRODUCTION

Alfred Fischer, Forest Hills, N.Y., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Sep. 17, 1979, Ser. No. 76,523

Int. Cl.[3] B01F 17/30; C07F 1/00

U.S. Cl. 252—356 24 Claims

1. A stable manganese salt solution containing at least 6% by weight of dissolved manganese that comprises

(a) manganese salts derived from a saturated, branched-

chain, aliphatic monocarboxylic acid component that contains 40 to 75 mole percent of a first acid component that contains one or more alpha, alpha-disubstituted acids having 5 to 28 carbon atoms and 25 to 60 mole percent of a second acid component that contains 50 to 100 mole percent of one or more beta-substituted acids having 6 to 18 carbon atoms and 0 to 50 mole percent of one or more acids substituted in a position further removed fromthe carboxyl group;

(b) 0 to 25% by weight, based on the weight of dissolved manganese in said solution, of a peptizing agent; and

(c) an inert organic solvent.

4,257,914

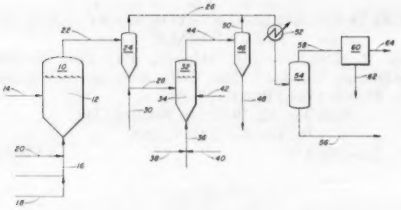
METHOD FOR THE REGENERATION OF SPENT MOLTEN ZINC CHLORIDE

Clyde W. Zielke, McMurray, and William A. Rosenhoover, Pittsburgh, both of Pa., assignors to Conoco, Inc., Stamford, Conn. and The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 10, 1979, Ser. No. 102,164

Int. Cl.[3] **B01J** *27/32, 35/12;* **C10G** *1/06;* **C01B** *9/00*

U.S. Cl. 252—415 **9 Claims**



1. In a process for regenerating spent molten zinc chloride which has been used in the hydrocracking of coal or ash-containing polynuclear aromatic hydrocarbonaceous materials derived therefrom and which contains zinc chloride, zinc oxide, zinc oxide complexes and ash-containing carbonaceous residue, said process consisting essentially of:

(a) subjecting said spent molten zinc chloride to vapor phase oxidative treatment by a mixture of air and hydrogen chloride gas in a primary regeneration zone to produce effluent zinc chloride vapors which contain entrained zinc oxide, zinc oxide complexes and residual ash-containing carbonaceous solids;

(b) separating said zinc chloride vapors from said entrained solids;

(c) subjecting said separated solids to vapor phase oxidative treatment by a mixture of air and hydrogen chloride gas in a secondary regeneration zone to yield said zinc chloride in vapor form; and

(d) recovering said zinc chloride in a substantially solids-free molten state,

the improvement comprising; adding a finely-divided clay said clay comprising a reactive aluminum silicate to said primary regeneration zone in an amount sufficient to suppress the vaporization of ash metals other than zinc at primary regeneration conditions.

2. The improvement of claim **1** wherein said clay is added in an amount up to about 25 weight percent based on the weight of said ash.

3. The improvement of claim **2** wherein said clay is selected from the group consisting of kaolin clays.

4,257,915

PHOTOPOLYMER INITIATOR SYSTEM CONTAINING A SEMICONDUCTOR, A REDUCING AGENT AND AN OXIDIZING AGENT

David F. Eaton, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 23, 1979, Ser. No. 59,993

Int. Cl.[3] **G03C** *1/68;* **B01J** *31/02*

U.S. Cl. 252—428 **6 Claims**

1. A photoinitiator for polymerizing ethylenically unsaturated monomers comprising, based on total weight of the photoinitiator:

(i) about 70 to 95 percent, of the combined total of components (i) and (ii), of a wide-band n-type inorganic pigment semiconductor characterized by (a) an energy gap greater than about 2.0 electron volts, and (b) a conduction band potential under flat band conditions more negative than zero volts versus the saturated calomel electrode;

(ii) about 5 to 30 percent, of the combined total of components (i) and (ii), of an oxidant characterized by (a) reducibility by the semiconductor (i), (b) the reduction being irreversible as demonstrated by cyclic voltammetry, and (c) the reduction generating a free-radical capable of initiating photopolymerization; and

(iii) at least about 5 percent, of the combined total of components (i) and (ii), of an organic reductant capable of donating an electron to the semiconductor if (i), and having an oxidation potential relative to the saturated calomel electrode at least about 0.1 volt more negative than the valence band potential of (i).

4,257,916

PROCESS FOR THE PREPARATION OF A FUNCTIONALIZED SOLID PRODUCT

Ronald D. Hancock, Weybridge, and Jennie M. Kirk, Ashford, both of England, assignors to The British Petroleum Company Limited, London, England

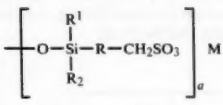
Filed Aug. 20, 1979, Ser. No. 68,143

Claims priority, application United Kingdom, Sep. 5, 1978, 35566/78

Int. Cl.[3] **B01J** *20/32, 31/02, 31/12;* **B05D** *7/00*

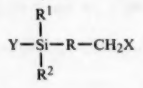
U.S. Cl. 252—430 **10 Claims**

1. A process for the production of a product containing groups of general formula (I)



(I)

wherein R is a divalent radical containing up to 20 carbon atoms, R^1 and R^2 are alkoxy or aryloxy groups containing up to 20 carbon atoms, or hydrolysis products thereof, M is a metallic ion and (a) is an integer corresponding to the valency of M, which process comprises reacting an inorganic oxide containing surface hydroxyl groups selected from the group consisting of alumina, titania, zirconia, glass, sepiolite, a zeolite molecular sieve and silica in a first stage with a compound of general formula (III)

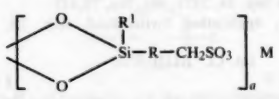


(III)

wherein R, R^1 and R^2 are as hereinbefore defined, Y is a halogen atom or an alkoxy or aryloxy group containing up to 20 carbon atoms and X is a chlorine atom, characterized by the fact that the reaction is effected in the absence of a catalyst and the reaction product of the first stage is reacted in a second

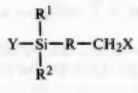
stage with an aqueous solution of a water soluble inorganic sulphite to form a sulphonate salt.

2. A process for the production of a product containing groups of general formula (II)



(II)

wherein R is a divalent radical containing up to 20 carbon atoms, R^1 is an alkoxy or aryloxy groups containing up to 20 carbon atoms, or hydrolysis products thereof, M is a metallic ion and (a) is an integer corresponding to the valency of M, which process comprises reacting an inorganic oxide containing surface hydroxyl groups selected from the group consisting of alumina, titania, zirconia, glass, sepiolite, a zeolite molecular sieve and silica, in a first stage with a compound of general formula (III)



(III)

wherein R and R^1 are as hereinbefore defined and R^2 is an alkoxy or aryloxy group or hydrolysis product thereof, Y is a halogen atom or an alkoxy or aryloxy group containing up to 20 carbon atoms and X is a chlorine atom, characterised by the fact that the reaction is effected in the absence of a catalyst and the reaction product of the first stage is reacted in a second stage with an aqueous solution of a water soluble inorganic sulphite to form a sulphonate salt.

4,257,917

CATALYST FOR PREPARATION OF SOLUBLE POLY(DICHLOROPHOSPHAZENES)

Kennard A. Reynard, and Arthur H. Gerber, both of Cleveland, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 758,740, Jan. 12, 1977, Pat. No. 4,139,598, which is a division of Ser. No. 474,055, May 28, 1974, Pat. No. 4,005,171. This application Nov. 7, 1978, Ser. No. 958,585

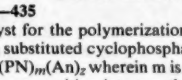
Int. Cl.³ B01J *27/14*

U.S. Cl. 252—435 **9 Claims**

1. A catalyst for the polymerization of dihalophosphazenes comprising a substituted cyclophosphazene represented by the formula $(X)_y(PN)_m(An)_z$ wherein m is a positive integer from 3 to 7, y and z are positive integers the sum of y plus z being equal to 2m and z being at least 1;

X is a halogen selected from the group consisting of Cl, Br and F;

An is an monovalent radical selected from the group consisting of



where R_1 is a monovalent radical selected from the group consisting of polyhaloalkyl where the halogen is F, Cl or mixtures thereof, perfluoraryl and perchloroaryl;

R_2 is a monovalent radical selected from the group consisting of F, Cl, lower alkyl (C_1–C_5), aryl, substituted alkyl and substituted aryl and

all of the monovalent radicals are not required to be identical, and for phosphazenes containing two or more X's all of the X's need not be identical; and

wherein said substitued cyclophosphazenes are phosphazene derivatives consisting of the reaction product formed by reacting at least one cyclophosphazene represented by the formula $(X_2PN)_m$ in which X represents a halogen selected from the group consisting of F, Cl and Br and in which not all of the X's are required to be the same, and m is an integer of 3 to 7, with at least one metallic or quaternary salt of said monovalent radical R_1COO—or monovalent radical R_2SO_3—and wherein at least one X in the compound $(X_2PN)_m$ is replaced, and all of the displacing groups and X groups are not required to be the same.

4,257,918

CATALYST MIXTURE FOR THE CATALYTIC REDUCTION OF NITROGEN OXIDES IN GASEOUS MIXTURES

Edward Ginger, Northbrook, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 037,615, May 10, 1979. This application Apr. 7, 1980, Ser. No. 137,700

Int. Cl.³ B01J *23/22, 23/72, 23/84, 27/02*

U.S. Cl. 252—440 **4 Claims**

1. A physical mixture of a first catalyst and a second catalyst useful for the reductive removal of a nitrogen oxide from a gaseous stream containing said oxide, said first catalyst comprising on an elemental basis from about 1 to about 15 wt.% copper or a copper compound supported on a first porous carrier material and said second catalyst comprising on an elemental basis from about 4 to about 10 wt.% of a first component selected from the group consisting of vanadium, chromium, molybdenum and tungsten, and compounds thereof, in combination with on an elemental basis from about 4 to about 10 wt.% of a second component selected from the group consisting of iron, cobalt and nickel, and compounds thereof, said combination being supported on a second porous carrier material.

4,257,919

METHOD OF TRANSFERRING A PASSIVATING AGENT TO OR FROM A CRACKING CATALYST

John S. Roberts; Dwight L. McKay; Brent J. Bertus, and H. Wayne Mark, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 1, 1979, Ser. No. 90,182

Int. Cl.³ B01J *23/14, 23/18*

U.S. Cl. 252—461 **20 Claims**

1. A method for adding a suitable passivating agent, which has the capability to transfer by inter-particle transfer, to a cracking catalyst which has an insufficient concentration of said suitable passivating agent comprising the step of contacting said cracking catalyst under suitable transfer conditions with a suitable refractory material which contains a greater concentration of said suitable passivating agent than said cracking catalyst contains.

3. A method in accordance with claim 1 wherein said suitable passivating agent is selected from the group consisting of elemental antimony, compounds of antimony, elemental tin, compounds of tin and mixtures of any two or more thereof.

11. A method for recovering a suitable passivating agent, which has the capability to transfer by inter-particle transfer, from a used cracking catalyst which has been previously treated with said suitable passivating agent but which has become catalytically less active than desired comprising the steps of:

contacting said used cracking catalyst under suitable transfer conditions with a suitable refractory material, which has a smaller concentration of said suitable passivating agent than is contained on said used cracking catalyst, to thereby effect the transfer of at least a portion of said suitable passivating agent contained on said used catalyst to said suitable refractory material; and

separating the resulting used cracking catalyst having a depleted passivating agent content from the resulting suitable refractory material having an enriched passivating agent content.

4,257,920

CATALYST CONTAINING A NOBLE METAL OF THE VIIITH GROUP, COPPER OXIDE, ZINC OXIDE AND A RARE EARTH METAL, ITS MANUFACTURE AND USE IN THE CONVERSION OF CARBON MONOXIDE

Andre Sugier, Rueil Malmaison; Philippe Courty, Houilles, and Edouard Freund, Rueil Malmaison, all of France, assignors to Societe Francaise des Produits pour Catalyse, Rueil-Malmaison, France

Filed Nov. 16, 1979, Ser. No. 95,007

Claims priority, application France, Nov. 17, 1978, 78 32704

Int. Cl.[3] B01J *21/04, 23/10, 23/60, 23/72*

U.S. Cl. 252—462 6 Claims

1. A catalyst containing from 0.01 to 1% by weight of a noble metal of the VIII[th] group, 10 to 60% by weight of a copper oxide, 5 to 40% by weight of zinc oxide, 1 to 20% by weight of at least one rare earth metal oxide, and 30 to 70% of aluminous cement, said aluminous cement comprising from 10 to 50% by weight of at least one oxide selected from CaO and BaO and 30 to 85% by weight of Al_2O_3, the total content of CaO, BaO and Al_2O_3 in said aluminous cement being at least 70% by weight.

4,257,921

CATALYST FOR THE OXIDATION OF BUTENE

William E. Slinkard, Corpus Christi, Tex., and Anthony B. Baylis, Berkely Heights, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 828,709, Aug. 29, 1979. This application Nov. 23, 1979, Ser. No. 96,875

Int. Cl.[3] B01J *23/10, 23/22, 23/18, 23/84*

U.S. Cl. 252—462 14 Claims

1. A catalyst consisting essentially of composition of the empirical formula:

$$V_fSb_gX_hMe_iO_j$$

in which formula V is vanadium, Sb is antimony, O is oxygen, X is at least one member selected from the group consisting of bismuth, niobium, neodymium, samarium, zinc, zirconium and chromium, and Me is at least one member selected from the group consisting of aluminum, iron and tin, and wherein the atomic ratio of the elements in said composition is such that when f is 10, g is from about 1 to 9, h is from about 1 to 9, i is from 0 to about 8, j is a number of at least 20 such that the valence requirements of V, Sb, X and Me are satisfied, and the sum of g, h and i does not exceed about 20

4,257,922

PROCESS FOR COAL LIQUEFACTION AND CATALYST

Dae K. Kim, Naperville; Ralph J. Bertolacini, Chesterton; L. Charles Gutberlet, Wheaton, and Ken K. Robinson, St. Charles, all of Ill., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 13, 1979, Ser. No. 20,209

Int. Cl.[3] B01J *23/16, 23/00*

U.S. Cl. 252—465 8 Claims

1. A supported catalyst suitable for hydroconversion of coal solids to coal liquids, said catalyst comprising a catalytically active substance on support particles, said particles having essentially bimodal pore distribution with peak concentrations of smaller pores below about 600 angstroms and a peak concentration of larger pores above about 600 angstroms, the average diameter of the smaller pores ranging from about 100–200 angstroms, and the average diameter of the larger pores being in excess of 1,000 angstroms, said catalyst including at least 5% of the total pore volume of the larger pores and at least 70% of the total pore volume of the smaller pores.

4,257,923

SUBSTITUTED DELTA-LACTONES IN PERFUME COMPOSITIONS

Sina D. Escher, Le Lignon, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Filed Sep. 14, 1979, Ser. No. 75,417

Claims priority, application Switzerland, Sep. 29, 1978, 10174/78

Int. Cl.[3] E11B *9/00*

U.S. Cl. 252—522 R 1 Claim

1. Method for enhancing, improving or modifying the odorous properties of a perfume composition which comprises adding thereto a perfuming effective amount of 6-ethyl-5,6-dihydro-2H-pyran-2-one or 6-n-butyl-5,6-dihydro-2H-pyran-2-one to impart to said perfume composition a constant and homogeneous spicy and fruity odorous note thereto.

4,257,924

ANTI-STATIC COMPOSITION COMPRISING A CATIONIC SURFACTANT, RUE OIL AND PROPYLENE GLYCOL

Richard M. Chester, Syracuse, N.Y., assignor to Bect Chemical Co., Syracuse, N.Y.

Filed Dec. 6, 1978, Ser. No. 967,079

Int. Cl.[3] C11D *1/62, 1/38;* D06M *13/46*

U.S. Cl. 252—547 9 Claims

1. An antistatic composition having prolonged discharge capabilities comprising:

a cationic surfactant, rue oil, and propylene glycol, where the rue oil is about 0.1 percent of the composition and the propylene glycol is about 1.0 percent.

4,257,925

PLASTICS MATERIAL INCORPORATING RECLAIMED TIRE RUBBER

Graham F. Freeguard, 16, Church Dr., Keyworth, Nottinghamshire, England

Filed May 30, 1979, Ser. No. 43,947

Claims priority, application United Kingdom, May 31, 1978, 25509/78

Int. Cl.[3] B29H *19/00*

U.S. Cl. 260—2.3 9 Claims

1. A method of making plastics material which method is characterized in that it comprises swelling reclaimed tyre rubber which has been reduced to an average particle size of between 5 and 3,000 microns by contacting with a quantity of monomer which is insufficient to saturate said reclaimed tyre rubber for a period time of less than about 30 minutes and polymerizing the swollen mass.

4,257,926

ADHESION OF RUBBER TO REINFORCING MATERIALS

Shozo Tanimura, Minoo; Yasuhisa Saito; Hiroshi Horiuchi, both of Toyonaka; Kazunori Mieno, Nishinomiya; Shinji Nakao, Sakai; Takaaki Nakano, Takarazuka, and Kenzo Kamei, Sakai, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 24, 1978, Ser. No. 872,020

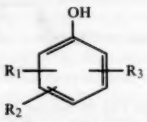
Claims priority, application Japan, Jan. 24, 1977, 52/6978; Jan. 26, 1977, 52/8024; Jan. 31, 1977, 52/10107

Int. Cl.[3] C08L *7/00, 9/00, 11/00, 61/04*

U.S. Cl. 260—3 3 Claims

1. A vulcanizable rubber composition comprising (I) a rubber component selected from at least one member of the group consisting of natural rubber, styrene-butadiene copolymer rubber, polyisoprene rubber, polybutadiene rubber, acrylonitrilebutadiene rubber and polychloroprene rubber, (II) a compound which is capable of generating formaldehyde by heating, and (III) a co-polycondensate resin prepared by condensing

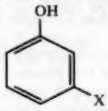
(A) a resol type pre-polycondensate prepared by reacting at least one of a monovalent phenol of the formula (a):



(a)

wherein R_1, R_2 and R_3 are the same different and are each hydrogen, an alkyl having 1 to 12 carbon atoms, and aryl having 6 to 12 carbon atoms or an aralkyl having 7 to 12 carbon atoms, and formaldehyde or acetaldehyde in the presence of an alkaline catalyst, and

(B) at least one of the compounds of the formula (b):

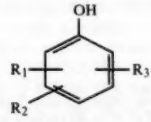


(b)

wherein X is —OH, —NH_2, —O—CO—R_4 or —O—R_5, and R_4 and R_5 are each an alkyl having 1 to 4 carbon atoms, said compounds of the formula (a) and the formula (b) being used in a molar ratio of 0.75/0.25 to 0.25/0.75, while distilling off water present in the reaction system, and then solidifying the reaction mixture, said component (II) being added in an amount of 0.3 to 10 parts by weight per 100 parts by weight of component (I) and said component (III) being added in an amount of 0.5 to 10 parts by weight per 100 parts by weight of component (I).

2. In a method for bringing about the adhesion between rubber and reinforcing materials by applying a vulcanizable rubber composition comprising natural or synthetic rubber to a pretreated or untreated reinforcing material and vulcanizing the rubber composition, the improvement which comprises using a vulcanizable rubber composition comprising (I) a rubber component selected from at least one member of the group consisting of natural rubber, styrene-butadiene copolymer rubber, polyisoprene rubber, polybutadiene rubber, acrylonitrile butadiene rubber and polychloroprene rubber, (II) a compound which is capable of generating formaldehyde by heating, and (III) a co-polycondensate resin prepared by condensing,

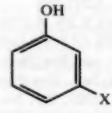
(A) a resol type pre-polycondensate prepared by reacting at least one of monovalent phenols of the formula (a):



(a)

wherein R_1, R_2 and R_3 are the same or different and are each hydrogen, an alkyl having 1 to 12 carbon atoms, an aryl having 6 to 12 carbon atoms or an aralkyl having 7 to 12 carbon atoms, and formaldehyde or acetaldehyde in the presence of an alkaline catalyst, and

(B) at least one of the compounds of the formula (b):



(b)

wherein X is —OH, —NH_2, —O—CO—R_4 or —O—R_5, and R_4 and R_5 are each an alkyl having 1 to 4 carbon atoms, said compounds of the formula (a) and the formula (b) being used in a molar ratio of 0.75/0.25 to 0.25/0.75, while distilling off water present in the reaction system, and then solidifying the reaction mixture, said component (II) being added in an amount of 0.3 to 10 parts by weight per 100 parts by weight of component (I) and said component (III) being added in an amount of 0.5 to 10 parts by weight per 100 parts by weight of component (I).

4,257,927

INORGANIC ORGANIC COESTER STABILIZERS

William E. Leistner, Atlantic Beach, N.Y.; Motonobu Minagawa, Kosigaya, Japan; Yutaka Nakahara, Iwatsuki, Japan, and Tohru Haruna, Okegawa, Japan, assignors to Argus Chemical Corp., Brooklyn, N.Y.

Division of Ser. No. 772,994, Feb. 28, 1977, Pat. No. 4,146,517.
This application Oct. 5, 1978, Ser. No. 948,888
Int. Cl.³ C08K *5/52*
U.S. Cl. 260—23 XA **20 Claims**

1. As a new composition of matter, a coester terminating in a free hydroxyl group and having a molecular weight between 700 and about 10,000, of at least one polyhydric phenol having 3 phenolic hydroxyl groups and 3 benzenoid rings substituted with zero to three alkyl, cycloalkyl, or aralkyl groups having 1 to 10 carbon atoms, with carbonic acid and an inorganic acid selected from the group consisting of phosphorous acid and phosphoric acid, in which the molar proportions of carbonic acid to inorganic acid range from 19:1 to 1:19.

15. A stabilized synthetic resin composition comprising a synthetic resin selected from the group consisting of olefin polymers, vinyl chloride polymers, acrylonitrile copolymers, and polyamides comprising a synthetic resin and 0.05 to 5 percent by weight of the resin of a coester terminating in a free hydroxyl group and having a molecular weight between 700 and about 10,000, of at least one polyhydric phenol having 2 to 3 phenolic hydroxyl groups and 1 to 3 benzenoid rings, substituted with zero to three alkyl, cycloalkyl, or aralkyl groups having 1 to 10 carbon atoms, with carbonic acid and an inorganic acid selected from the group consisting of phosphorous acid and phosphoric acid, in which the molar proportions of carbonic acid to inorganic acid range from 19:1 to 1:19.

4,257,928

POLYESTER ADHESIVES

Raymond N. Vachon, and Hazel R. R. Partin, both of Kingsport, Tenn., assignors to Permabond International Corporation, Englewood, N.J.

Filed Jan. 28, 1980, Ser. No. 116,129
Int. Cl.³ C08K *5/05, 5/13*
U.S. Cl. 260—33.4 R **9 Claims**

1. An adhesive composition which is spreadable as a coating onto paper, said composition comprising a linear, water-dissipatable polyester derived essentially from

(A) at least one dicarboxylic acid,

(B) at least one diol, at least 20 mole percent of said diol being a poly(ethylene glycol) having the formula

$$H\text{-}(OCH_2CH_2)_n\text{-}OH$$

wherein n is an integer of from two to about ten, and

(C) at least one difunctional dicarboxylic acid sulfomonomer containing a —SO_3M group attached to an aromatic nucleus, wherein M is hydrogen or Na^+, Li^+, K^+, or a combination thereof, said sulfo-monomer constituting at least about 8 mole percent to about 45 mole percent of the sum of the moles of said components (A) and (C),

and from about 5 to about 20% by weight, based on the weight of said polyester, of dibenzal sorbitol.

4,257,929

POLY(BUTYLENE TEREPHTHALATE) MOLDING RESIN

Willem F. H. Borman, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Aug. 16, 1979, Ser. No. 67,015
Int. Cl.[3] C08L 67/00
U.S. Cl. 260—40 R 4 Claims

1. A composition comprising
(i) a poly(1,4-butylene terephthalate) resin, and
(ii) a particulate mineral filler, individual particles of said mineral filler being coated with unsintered poly(tetrafluoroethylene) resin.

4,257,930

THICKENING AGENTS FOR UNSATURATED POLYESTER RESIN COMPOSITIONS

Martin L. Feldman, East Brunswick, and James T. De Groff, Oldwick, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 44,725, Jun. 1, 1979. This application Feb. 8, 1980, Ser. No. 119,719
Int. Cl.[3] C09L 67/00
U.S. Cl. 260—40 R 19 Claims

1. An unsaturated polyester resin composition that comprises
(a) an unsaturated polyester resin formed by condensing a saturated dicarboxylic acid and an unsaturated dicarboxylic acid with a dihydric alcohol;
(b) an unsaturated monomer capable of reacting with the unsaturated polyester resin to form cross-linkages; and
(c) a thickening agent comprising
(1) 25% to 70% by weight of a thickener that is a Group II-A metal oxide or hydroxide and
(2) 30% to 75% by weight of an unsaturated polyester vehicle comprising
(a) 50% to 95% by weight of an unsaturated polyester that is the product of the reaction of a dicarboxylic acid component containing 80 to 90 mole % of at least one unsaturated aliphatic dicarboxylic acid having 4 to 8 carbon atoms and 10 to 20 mole % of at least one saturated aromatic dicarboxylic acid with an alcohol component containing 40 to 60 mole % of at least one glycol having 2 to 6 carbon atoms and 40 to 60 mole % of at least one monohydric alcohol having 6 to 12 carbon atoms, in the amount of 0.4 mole to 0.6 mole of the dicarboxylic acid component per mole of the alcohol component, and
(b) 5% to 50% by weight of an unsaturated monomer capable of reacting with said unsaturated polyester to form cross-linkages.

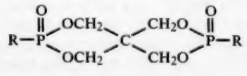
4,257,931

FLAME RETARDANT POLY(BUTYLENE TEREPHTHALATE) COMPOSITIONS COMPRISING MELAMINE PYROPHOSPHATE AND A PHOSPHONATE

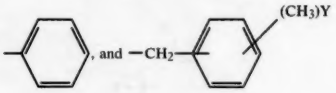
Albrecht H. Granzow, Somerset, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 29, 1980, Ser. No. 116,524
Int. Cl.[3] C08K 5/34, 5/52, 5/53
U.S. Cl. 260—45.8 NE 11 Claims

1. A method of flame retarding a poly(1,4-butylene terephthalate) polymer comprising incorporating therewith an effective flame retardant amount of a combination of (A), a pentaerythrityl phosphonate of Formula (I)



wherein R is selected from —CN, —CH_3,



wherein y is 0 to 4, and (B), melamine pyrophosphate.

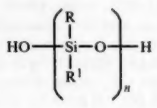
4,257,932

CURABLE COMPOSITIONS AND PROCESS

Melvin D. Beers, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 919,544, Jun. 27, 1978, abandoned. This application Aug. 28, 1979, Ser. No. 70,435
Int. Cl.[3] C08L 91/00
U.S. Cl. 260—18 S 40 Claims

1. A fluid composition stable under substantially anhydrous conditions and curable in the presence of moisture to a self-bonding highly thermally stable elastic solid resistant to hot hydrocarbon oils, said composition comprising:
(a) 100 parts by weight of a silanol chain-stopped polydiorganosiloxane of the formula:



wherein R and R^1 are each, independently, organic radicals of up to 8 carbon atoms selected from hydrocarbyl, halohydrocarbyl and cyano lower alkyl and n is an average number of from about 10 to 15,000;
(b) from 2 to 20 parts by weight of a fluid polysiloxane containing a high degree of trifunctionality, tetrafunctionality or a mixture of tri- and tetrafunctionality and comprising
(i) from 25 to 60 mole percent of monoalkylsiloxy units, siloxy units or a mixture of such units;
(ii) from 1 to 6 mole percent of trialkylsiloxy units; and
(iii) from 34 to 74 mole percent of dialkylsiloxy units,
said polysiloxane containing from about 0.1 to about 2% by weight of silicon-bonded hydroxyl groups;
(c) from 10 to 100 parts by weight of a finely divided silica filler;
(d) from 3 to 10 parts by weight of a cross-linking silane of the formula:

$$R_m^2 \, Si \, (OR^3)_{4-m}$$

wherein R^2 has the values defined from R and R^1 hereinabove, R^3 is an organic radical of 6 to 30 carbon atoms selected from hydrocarboyl and halohydrocarboyl and m has a value of 0 or 1; and
(e) from 0.01 to 10 parts by weight of a curing catalyst of the group consisting of an organic tin salt of an organic acid and a tin salt of an organic acid, said organic acid containing from 2 to 6 carbon atoms.

4,257,933

COPOLYMERS SOLUBLE IN WATER IN SALT FORM AND LATEX PAINTS CONTAINING THE SAME

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 10, 1980, Ser. No. 111,018
Int. Cl.[3] C08L 35/06; C07D 3/76
U.S. Cl. 260—23 S 4 Claims

1. A copolymer of an ester of a solution copolymer of styrene or vinyl toluene and allyl or methallyl alcohol containing

about 3% to about 15% by weight of the hydroxy group the hydroxy groups of said copolymer being esterified with from 20% to 65% of the weight of the ester of ethylenically unsaturated monocarboxylic fatty acid containing from 8–22 carbon atoms, said ester being copolymerized with monoethylenically unsaturated monomers including from about 2% to about 15%, based on the total weight of the final copolymer, of a monoethylenically unsaturated carboxylic acid copolymerizable with said ester, said monoethylenically unsaturated monomers comprising nonreactive monomer and from 5% to 50% by weight of the total monomers of said carboxylic acid monomer.

4,257,934

FLEXURAL MODULUS PAINTABLE RUBBER COMPOSITION

Joseph F. O'Mahoney, Jr., Stone Mountain, Ga., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 7, 1979, Ser. No. 92,246
Int. Cl.[3] C08L *93/00*
U.S. Cl. 260—27 BB **8 Claims**

1. A composition comprising a blend on a weight percent basis of 30 to 70 percent of an styrene-butadiene rubber, 30 to 70 percent of an EPDM rubber and 40 to 20 percent of a styrene-butadiene resin with about 1 to 20 parts per hundred of said blend of a tackifier resin having a melting point of about 100° to about 165° C.

4,257,935

COLOR DEVELOPING SHEET FOR PRESSURE-SENSITIVE RECORDING SYSTEMS

Sadao Sekiguchi, Minoo; Kojiro Matsumoto, Takarazuka; Tetsuo Ishikawa, Ibaraki; Saburo Mishiba, and Nobujiro Izaki, both of Niihama, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

Division of Ser. No. 745,261, Nov. 26, 1976, Pat. No. 4,125,675. This application Jun. 30, 1978, Ser. No. 921,014
Claims priority, application Japan, Nov. 28, 1975, 50/142498
Int. Cl.[3] C08L *47/00*
U.S. Cl. 260—29.7 H **8 Claims**

1. A coating composition for formation of a color developer layer in preparation of a color developer sheet sensitized in a color developing property on contact with a chromogenic material, which comprises an organic color developer and, as a binder, a latex of a copolymer having a solid content of from about 20 to 60% by weight prepared by polymerization of a mixture consisting essentially of about 20 to 70% by weight of at least one aliphatic conjugated diolefin monomer having 4 to 10 carbon atoms optionally substituted with halogen, about 0.5 to 15% by weight of at least one unsaturated carboxylic acid monomer having not more than 16 carbon atoms and about 15 to 79.5% by weight of at least one copolymerizable olefinic group containing monomer having not more than 16 carbon atoms said copolymer having a gel content of about 95 to 100% by weight.

4,257,936

SELF-BONDING SILICONE COMPOSITIONS

Yasuji Matsumoto, 887-35, Ohaza Ushizawa, Ohta-shi, Gunma prefecture; Bunjiro Murai, 1317-2 Iizuka-Cho, Ohta-shi, Gunma prefecture, and Reeko Kawamura, 887-35, Ohaza Ushizawa, Ohta-shi, Gunma prefecture, all of Japan

Filed Sep. 26, 1978, Ser. No. 945,947
Claims priority, application Japan, Sep. 26, 1977, 52-115367
Int. Cl.[3] G08L *83/04;* **C08L** *83/10*
U.S. Cl. 260—37 SB **16 Claims**

1. A self-bonding silicone composition comprising (A) 100 parts by weight of organopolysiloxane having in the molecule at least two units of the general formula

$$R_a^1R_b^2\,SiO_{\frac{4-(a+b)}{2}}$$

wherein R^1 is an alkenyl radical, R^2 is a substituted or non-substituted monovalent hydrocarbon radical without an aliphatic unsaturated bond, and a has a value of 1 or 2, b has a value of 0, 1, or 2, and a+b has a value of 1, 2, or 3; (B) from 0.5 to 20 parts by weight of an organohydrogenpolysiloxane having at least one unit of the general formula

$$R_c^3H_dSiO_{\frac{4-(c+d)}{2}}$$

wherein R^3 is a substituted or non-substituted monovalent hydrocarbon radical, c has a value of 0, 1, or 2, d has a value of 1 or 2, and c+d has a value of 1, 2, or 3, and having at least three hydrogen atoms attached to silicon atoms so that the number of hydrogen atoms attached to silicon atoms for each R^1 of organopolysiloxane (A) is from 0.5 to 4.0; (C) from 1 to 10 parts by weight of a self-bonding organosilicon compound having in the molecule at least one hydrogen atom attached to the silicon atom and at least one unit of the general formula

$$\equiv Si-Q^1-\underset{\underset{O}{\|}}{C}-O-Q^2-Si\,(OR^4)_3$$

wherein Q^1 and Q^2 are linear or branched alkylene radicals and R^4 is an alkyl radical of carbon atoms of one to four; and (D) one to 100 ppm of platinum in the form of a platinum complex catalyst.

8. The composition of claim **1** wherein there is further present from 5 to 100 parts by weight of a filler in the composition selected from the class consisting of fumed silica, precipitated silica, silica aerosol, silica aerogel, ground silica, diatomaceous earth, oxidized steel, zinc oxide, titanium oxide, calcium carbonate, magnesium carbonate, zinc carbonate and carbon black.

4,257,937

MODIFIED POLYESTER COMPOSITIONS

Stuart C. Cohen, and Ronald L. Dieck, both of Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 6, 1978, Ser. No. 957,801
Int. Cl.[3] C08L *69/00, 67/02*
U.S. Cl. 260—40 R **24 Claims**

1. A thermoplastic resin composition comprising:
(a) a polyester resin base containing any of the following:
(i) a poly(1,4-butylene terephthalate) resin;
(ii) a blend of poly(1,4-butylene terephthalate) resin and a poly(ethylene terephthalate) resin:
(iii) a block copolyester of poly(1,4-butylene terephthalate) and an aromatic/aliphatic polyester;
(iv) a blend of (iii) and a poly(ethylene terephthalate) resin; or
(v) a blend of (iii) and a poly(1,4-butylene terephthalate) resin; and
(b) an impact modifier therefor comprising a combination of:
(i) a polyacrylate resin; and
(ii) an aromatic polycarbonate resin, in an amount of up to 60 parts per 100 parts by weight of (a) and (b) together.

4,257,938
PURIFICATION METHOD OF HUMAN FIBROBLAST INTERFERON

Kazuo Hosoi, Kamakura, and Hitoshi Ozawa, Hiratsuka, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 29, 1979, Ser. No. 89,165
Claims priority, application Japan, Nov. 7, 1978, 53-137035
Int. Cl.³ B01D *15/00*
U.S. Cl. 260—112 R **14 Claims**

1. In a method of purifying human fibroblast interferon, the steps which comprise successively

(a) absorbing an acidified solution of crude human fibroblast interferon upon a strongly acidic ion exchanger,

(b) contacting the ion exchanger with an eluant which is substantially neutral or weakly basic for a time sufficient to produce an effluent containing the interferon,

(c) contacting said effluent with a carrier having a chelating residue and including at least one metal ion selected from the group consisting of Co^{++}, Ni^{++}, Zn^{++}, and Cu^{++}, wherein said metal ion is chelated to the chelating residue so as to absorb the interferon, and

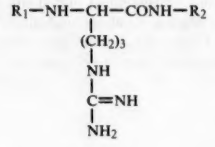
(d) contacting said carrier with an eluant for a time sufficient to produce a purified and concentrated interferon solution.

4,257,939
PEPTIDE DERIVATIVE

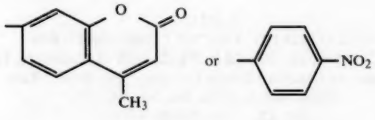
Shumpei Sakakibara, Suita, Japan, assignor to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 25, 1979, Ser. No. 87,922
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R **6 Claims**

1. A peptide derivative having the formula



wherein R_1 is a group selected from the group consisting of seryl, phenylalanyl-seryl, threonyl and leucyl-threonyl groups, and R_2 is

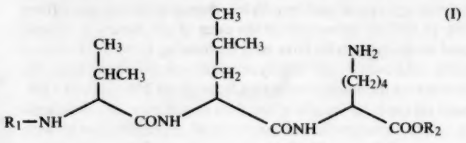


4,257,940
VALYLLEUCYLLYSINE DERIVATIVES, PROCESS FOR PRODUCING SAME AND METHOD FOR MEASURING ACTIVITY OF ENZYMES USING SAME

Setsuro Fujii, Toyonaka; Mamoru Sugimoto, Chiba, and Takashi Yaegashi, Funabashi, all of Japan, assignors to Torii & Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1979, Ser. No. 88,321
Claims priority, application Japan, Oct. 30, 1978, 53/133394
Int. Cl.³ C07C *103/52;* **C12Q** *1/00, 1/36*
U.S. Cl. 260—112.5 R **3 Claims**

1. A valylleucyllysine derivative represented by the formula,



(I)

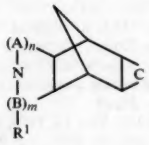
wherein R_1 represents hydrogen or benzoyl and R_2 represents naphthyl.

4,257,941
POLYCYCLIC NITROGEN-CONTAINING COMPOUNDS

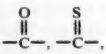
Rolf Platz, Mannheim; Werner Fuchs, Ludwigshafen; Norbert Rieber, Mannheim; Ulf-Rainer Samel, Mutterstadt; Johann Jung, and Bruno Wuerzer, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 781,767, Mar. 28, 1977, Pat. No. 4,189,434. This application May 1, 1978, Ser. No. 901,417
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615878
Int. Cl.³ C07D *487/04*
U.S. Cl. 260—152 **1 Claim**

1. A polycyclic nitrogen-containing compound of the formula

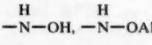


where B denotes the radicals $—SO_2—$,

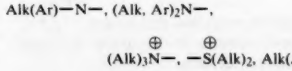


—S—, C denotes the radicals —N=N— or

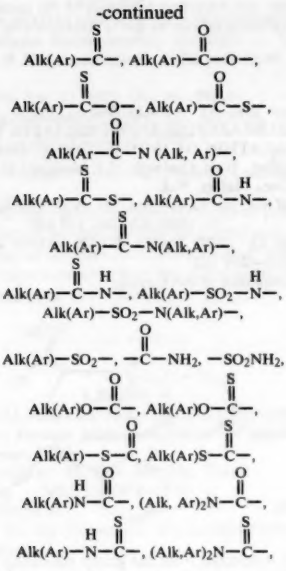
n is 0, m denotes one of the integers 0 and 1, and R^1 denotes hydrogen, alkyl of 1 to 30 carbon atoms, alkenyl of 1 to 30 carbon atoms, or alkynyl of 1 to 30 carbon atoms—all of which may be linear or branched, cyclic or acylic, phenyl, naphthyl, or benzyl, the above-mentioned radicals, apart from hydrogen, being unsubstituted or mono or polysubstituted by halogen (F, Cl, Br, I) or pseudo-halogen (CN, SCN), —OH, —SH, NO_2, —NO, =N—OH, =N—OAlk(Ar), =S, =NH, =NAlk(Ar), =O,



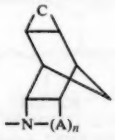
—COOH or $—SO_3H$, Alk(Ar)—O—, Alk(Ar)—S—,



-continued



(Alk, Ar)$_2$—N—SO$_2$—, Alk(Ar)—N=N—, primary, secondary or tertiary alkyl, haloalkyl, haloalkoxy, haloalkylmercapto, or the radical



Alk denoting alkyl and Ar denoting an unsubstituted phenyl or phenyl substituted by halogen or trifluoromethyl, and R^2 and R^3 are identical or different and each denotes (B)$_m$—R^4, R^4 having the same meanings as R^1, and salts of these compounds.

4,257,942

NEW WATER-INSOLUBLE AZO DYES

Francesco DeFeo, Milan, and Roberto Cipolli, Novara, both of Italy, assignors to Aziende Colori Nazionali Affini Acna S.p.A., Milan, Italy

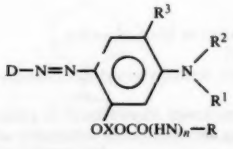
Filed Oct. 6, 1978, Ser. No. 949,092

Claims priority, application Italy, Oct. 6, 1977, 28321 A/77; Nov. 14, 1977, 29614 A/77

Int. Cl.[3] **C09B** *29/22, 31/02;* **C07C** *107/06*

U.S. Cl. 260—157 **65 Claims**

1. Azo dyes of general formula:



(I)

wherein:

D is selected from the group consisting of the residues of diazotizable components of the carbocyclic or heterocyclic series and said residues substituted by halogen, trifluoromethyl, CN, NO$_2$, C$_1$–C$_4$ alkyl, NHCO alkyl C$_1$–C$_4$, SO$_2$NH$_2$, SO$_2$ alkyl C$_1$–C$_4$, SO$_2$NH alkyl C$_1$–C$_4$, SO$_2$N (alkyl C$_1$–C$_4$)$_2$, SO$_2$NH phenyl, hydroxyethoxy, chloroethoxy, methoxyethoxy, COO alkyl C$_1$–C$_4$, COO cycloalkyl, phenyl, phenoxy, phenylazo or naphthylazo;

X is selected from the group consisting of the ethylene group or an ethylene group substituted by halogen, methyl, C$_1$–C$_4$ alkyl, aryl, aralkyl and CH$_2$OCO(HN)$_n$R in which R and n have the meanings defined below;

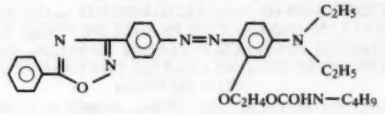
R is selected from the group consisting of C$_1$–C$_8$ alkyl, C$_1$–C$_8$ alkyl substituted by halogen, CN or COOH, C$_2$–C$_8$ alkenyl, C$_2$–C$_8$ alkenyl substituted by halogen, CN or COOH, aryl, aryl substituted by one or more halogens, C$_1$–C$_4$ alkyl or C$_1$–C$_4$ alkoxyl, C$_1$–C$_8$ alkoxy, aryloxy, cycloalkoxy, aralkoxy, naphthyl, or naphthyl substituted by halogen, CN or COOH, or aralkyl;

R^1 and R^2 which are the same or different, are C$_1$–C$_4$ alkyl, C$_1$–C$_4$ alkyl substituted by halogen or CN, or aralkyl;

R^3 is hydrogen, halogen, C$_1$–C$_4$ alkyl, substituted C$_1$–C$_4$ alkyl, C$_1$–C$_4$ alkoxyl or substituted C$_1$–C$_4$ alkoxyl; and

n is zero or 1.

18. A dye according to claim **1** and having the formula:



4,257,943

DISPERSE AZO DYESTUFFS AND PROCESS FOR PREPARATION AND THEIR USE

Reinhard Hähnle, Königstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

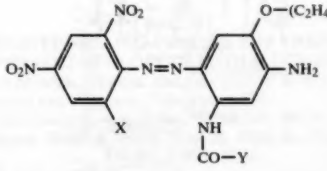
Filed Aug. 14, 1978, Ser. No. 933,521

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736785

Int. Cl.[3] **C09B** *29/26;* **D06P** *1/18, 3/54*

U.S. Cl. 260—207 **5 Claims**

1. A compound of the formula



in which X represents chlorine or bromine, Y and Z each represent methyl or ethyl, and n stands for the integer 1 or 2.

4,257,944

PROCESS FOR THE MANUFACTURE OF CYANO AZO DYES

Peter M. Quan; James S. Hunter; John R. Lawson, and John H. Moore, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 26, 1979, Ser. No. 24,082

Claims priority, application United Kingdom, Apr. 5, 1978, 13324/78

Int. Cl.[3] **C09B** *43/00*

U.S. Cl. 260—207.1 **8 Claims**

1. In a process for the preparation of an o-cyanoazo dyestuff

by reaction of the corresponding o-halogenazo dyestuff with a nitrile, the improvement which comprises employing as the nitrile a compound of the formula:

in which G is hydrogen or

X is hydrogen or halogen or R_1, Y is halogen, cyano, hydroxyl, alkyl sulphonyl, $-COOR_2$, $-COOH$, $-CH{=}CH_2$, or $-CH{-}CHR_2$, wherein R_2 is alkyl, or X and Y taken together are $=NH$, $=S$ or $=O$, and R and R_1, which are the same or different are hydrogen, alkyl, aryl, aralkyl or cycloalkyl, or an alkali metal salt of said nitrile in which the alkali metal is bonded to G when G is not hydrogen; in the presence of a copper catalyst and an acid acceptor.

4,257,945

METHOD OF HIGH-SPEED IN PARTICULAR BATCH PRODUCTION OF AROMATIC ESSENTIAL OILS FROM PERFUME-GENERATING PLANTS OR FROM PARTS THEREOF SUCH FOR INSTANCE AS SEEDS, BULBS, FLOWERS AS WELL AS A DEVICE FOR CARRYING OUT THIS METHOD

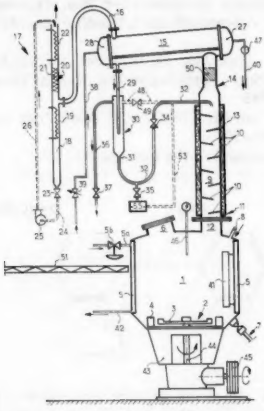
Jean-Pierre Martel, Mougins, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Apr. 24, 1978, Ser. No. 899,511

Claims priority, application France, Apr. 27, 1977, 77 12831

Int. Cl.[3] C11B *9/00*

U.S. Cl. 260—236.6 **10 Claims**



1. Method for the high-speed production of aromatic essential oils from perfume-generating plants or parts thereof, which comprises simultaneously crushing said plants or parts thereof into fine particles and forming therefrom an aqueous slurry while still further simultaneously heating said slurry as it is being formed to a temperature sufficiently high to form water vapors with a high content in essential oils from said plants, subjecting the thus formed vapors to fractional rectification under substantially atmospheric pressure while preventing passage of solid particles, thereby concentrating the content of the essential oils therein to form enriched vapors, condensing said enriched vapors, thereby forming a condensate, recovering said condensate, removing the essential oils from said condensate, and recycling a portion of the remaining condensate free of essential oils to the retification step.

4,257,946

BENZODIAZEPINE INTERMEDIATES FOR THE PREPARATION OF IMIDAZOBENZODIAZEPINES

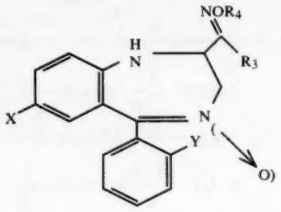
Armin Walser, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 43,417, May 29, 1979. This application Feb. 21, 1980, Ser. No. 123,525

Int. Cl.[3] C07D *243/16, 401/06, 403/06, 413/05*

U.S. Cl. 260—239 BD **1 Claim**

1. A compound of the formula



wherein X is selected from the group consisting of hydrogen, halogen, nitro and trifluoromethyl, Y is selected from the group consisting of hydrogen, halogen and trifluoromethyl, R_3 is selected from the group consisting of an amino or substituted amino selected from the group consisting of monoalkylamino, dialkylamino, anilino, monoethylanilino, morpholino, piperidino, pyrrolidino, 2-hydroxyethylamino, 2-aminoethylamino and carbalkoxymethylamino and R_4 is hydrogen or lower alkyl.

4,257,947

3-AMINO-2-HYDROXY, HALO OR MERCAPTOMETHYL-4-OXOAZETIDINES

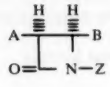
John G. Gleason, Delran; Kenneth G. Holden, Haddonfield, both of N.J., and William F. Huffman, Malvern, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 821,386, Aug. 3, 1977, Pat. No. 4,166,816, which is a continuation-in-part of Ser. No. 696,094, Jun. 14, 1976, Pat. No. 4,072,674, which is a continuation-in-part of Ser. No. 626,686, Oct. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 574,225, May 5, 1975, abandoned. This application Mar. 14, 1979, Ser. No. 20,293

Int. Cl.[3] C07D *205/08, 403/04*

U.S. Cl. 260—239 A **6 Claims**

1. A compound of the structure



in which:

A is azido, amino or blocked amino;

B is $-CH_2X^1$;

X^1 is OM, halo, methoxybenzylthio, triphenylmethylthio or mercapto;

M is hydrogen, lower alkylsulfonyl or phenylsulfonyl said phenyl being unsubstituted or substituted with a methyl or halo; and

Z is hydrogen, 2,4-dimethoxybenzyl, benzhydryl or methoxy substituted benzhydryl.

4,257,948

NOVEL EPOXIDATION AGENT AND PROCESS

Germain Costerousse, Saint-Maurice, and Jean G. Teutsch, Pantin, both of France, assignors to Roussel Uclaf, Paris, France

Filed Apr. 11, 1979, Ser. No. 29,135
Claims priority, application France, Apr. 19, 1978, 78 11517
Int. Cl.[3] C07J *17/00*
U.S. Cl. 260—239.55 R 12 Claims

1. An epoxidation agent comprising hydrogen peroxide and hexachloroacetone.

3. In the process of reacting an acrylic, cyclic or polycyclic compound containing at least one ethylenic unsaturation with an epoxidation agent to obtain the corresponding epoxidized compound, the improvement comprising using as the epoxidation agent the composition of claim 1.

4,257,949

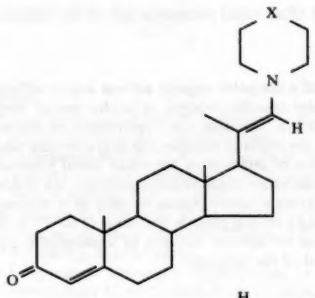
BISNORALDEHYDE-22-ENAMINE PROCESS

John M. Beaton, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

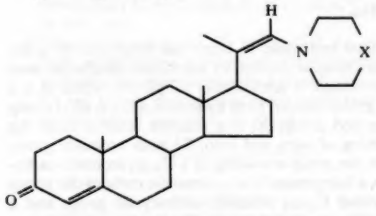
Filed Oct. 22, 1979, Ser. No. 87,420
Int. Cl.[3] C07J *43/00*
U.S. Cl. 260—239.55 R 60 Claims

1. A process for the preparation of bisnoraldehyde-22-enamines of the formula:

(IIIA)



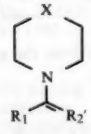
(IIIB)



which comprises

(a) contacting bisnoraldehyde (I) with an enamine of the formula:

(II)



in an organic solvent and

(b) recovering the bisnoraldehyde-22-enamine (III) where X, R_1 and R_2' are defined in the specification.

4,257,950

CONTINUOUS PREPARATION OF ε-CAPROLACTAM BY BECKMANN REARRANGEMENT

Peter Horn, Hirschberg; Otto-Alfred Grosskinsky, Ludwigshafen; Richard Thoma, Battenberg, and Hugo Fuchs, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 27, 1979, Ser. No. 79,329
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2845019
Int. Cl.[3] C07D *201/04*
U.S. Cl. 260—239.3 A 6 Claims

1. A process for the continuous preparation of ε-caprolactam by Beckmann rearrangement of cyclohexanone-oxime, dissolved in a solvent which is inert towards oleum and is immiscible with oleum and water, at an elevated temperature, with removal of the heat of rearrangement by evaporation of the solvent, wherein oleum containing caprolactam is circulated successively through a conveying zone, a mixing zone, a boiling zone and a separating zone, upstream of the conveying zone oleum is added at the rate at which it is consumed, in the mixing zone cyclohexanone-oxime dissolved in solvent is added under turbulent conditions, in the boiling zone the heat of rearrangement is removed in a conventional manner by evaporating the solvent and recycling the condensate, and in the separating zone the reaction mixture is separated into a solvent phase, from which solvent is withdrawn at the rate at which the phase is formed, and a caprolactam-containing oleum phase, which is removed at the rate at which it is formed.

4,257,951

TWO-STEP MILLING PROCESS FOR PREPARING PIGMENTARY COPPER PHTHALOCYANINE

Howard Matrick, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 62,334, Jul. 31, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 128,458
Int. Cl.[3] C09B *47/04*
U.S. Cl. 260—314.5 15 Claims

1. A two-stage milling process for preparing pigmentary copper phthalocyanine comprising milling crude copper phthalocyanine with a 5–400% by weight of $Al_2(SO_4)_3.15$–18 H_2O based on the crude and 0.6–3.7 cc per 100 grams of copper phthalocyanine of an organic liquid in the first stage, milling said crude further with an additional 1.2–9.8 cc per 100 grams of copper phthalocyanine of an organic liquid in a second stage, the total amount of organic liquid charged in both stages is in the range of 4–13 cc inclusive per 100 grams of copper phthalocyanine, treating the milled copper phthalocyanine with an emulsion of a water-insoluble organic liquid in water with or without a surface-active agent at a temperature of 24°–97° C. for 15 minutes to 10 hours, removing the organic liquid and recovering copper phthalocyanine in pigmentary form.

4,257,952

3-AMINO-TETRAHYDROCARBAZOLES

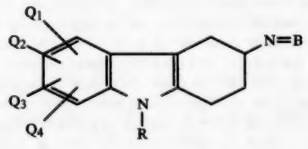
Aram Mooradian, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 803,891, Jun. 6, 1977, Pat. No. 4,172,834, which is a division of Ser. No. 579,157, May 20, 1975, Pat. No. 4,062,864, which is a continuation-in-part of Ser. No. 425,205, Dec. 17, 1973, Pat. No. 3,959,309, which is a continuation-in-part of Ser. No. 172,206, Aug. 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 793,545, Jan. 23, 1969, abandoned, which is a continuation-in-part of Ser. No. 659,606, Aug. 10, 1967, Pat. No. 3,642,816. This application Jun. 6, 1979, Ser. No. 45,917

Int. Cl.[3] C07D *209/88*

U.S. Cl. 260—315 9 Claims

1. A 3-(N=B)-9-R-1,2,3,4-tetrahydrocarbazole having the formula



where

N=B is NHR', NR'R" or NR'"—Y—NR'R", where R' and R" are lower-alkyl or Ar-lower-alkyl, R'" is hydrogen and Y is lower-alkylene;

R is hydrogen, lower-alkyl, Ar-lower-alkyl or lower-alkenyl, or R is Y-NR'R", where Y, R' and R" have the same meaning given above;

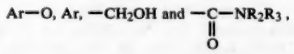
Q_1 is selected from the substituents of the groups designated (1), (3) and (4) below;

Q_2 is selected from the substituents of the groups designated (2), (3) and (4) below;

Q_3 is selected from the substituents of the groups designated (3) and (4) below;

Q_4 is selected from the substituents of the groups designated (2) and (4) below, where the substituents of the groups designated (1), (2), (3) and (4) are respectively:

(1)



where R_2 and R_3 are hydrogen or lower-alkyl,

(2) tertiary-lower-alkyl, hydroxy, trihalomethyl and nitro,

(3) lower-alkylthio

and

(4) hydrogen, non-tertiary-lower-alkyl, lower-alkoxy and halo, provided that when Q_2 and Q_4 are selected from the substituents

of the group designated (2) they are non-adjacent;

and Ar is phenyl;

where lower-alkyl and lower-alkoxy, every occurrence, have from one to six carbon atoms, lower-alkenyl has from three to six carbon atoms and lower-alkylene has from two to four carbon atoms.

8. 9-Carbethoxymethyl-3-(dimethylamino)-1,2,3,4-tetrahydrocarbazole.

9. 3-(Dimethylamino)-8-cyano-1,2,3,4-tetrahydrocarbazole.

4,257,953

METHOD FOR MAKING BISPHENOXIDE SALTS AND BISIMIDES DERIVED THEREFROM

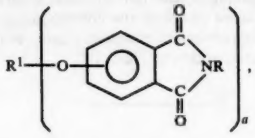
Frank J. Williams, III, Scotia, and Brent A. Dellacoletta, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 9, 1979, Ser. No. 37,442

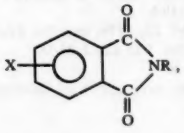
Int. Cl.[3] C07D *209/48*

U.S. Cl. 260—326 R 5 Claims

1. In the method of making aromatic either imides of the formula,



by heating a substituted phthalimide of the formula,



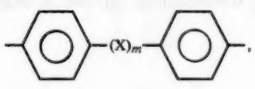
and a preformed alkali metal phenoxide salt of the formula,

$$R^1—OM)_a,$$

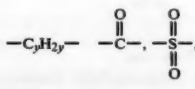
in the presence of a nonpolar organic solvent and an effective amount of a phase transfer catalyst, whereby special procedures are required to minimize the introduction of moisture and oxygen into the reaction mixture, the improvement which consists essentially of utilizing as the alkali metal phenoxide salt in the aromatic ether imide reaction mixture, the product obtained by refluxing a heterogenous mixture of a hydrocarbon solvent having a boiling point in the range of 80° C. to 200° C. at 760 torr and an aqueous solution of substantially equal moles of a phenol of the formula,

$$R^1\text{-}(OH)_a,$$

and alkali metal hydroxide to effect the separation of water from the heterogenous mixture by azeotropic distillation until the resulting mixture is substantially anhydrous, where R is a monovalent group selected from hydrogen, a $C_{(1-8)}$ alkyl group and a $C_{(6-13)}$ aryl group, X_1 is a member selected from the group consisting of nitro and halo, R^1 is an aromatic group selected from the group consisting of a $C_{(6-30)}$ aromatic carbocyclic group, a halogenated $C_{(6-30)}$ aromatic carbocyclic group and an alkylated $C_{(6-30)}$ aromatic carbocyclic group and a divalent organic group of the formula,



where X is a member selected from the group consisting of divalent groups of the formula,



—O—, and —S—, m is 0 or 1, y is a whole number from 1 to 5 and a is an integer equal to 1 or 2, and when a is 1, R^1 is monovalent and when a is 2, R^1 is divalent.

4,257,954

NOVEL COMPOUNDS, PROCESSES AND MARKING SYSTEMS

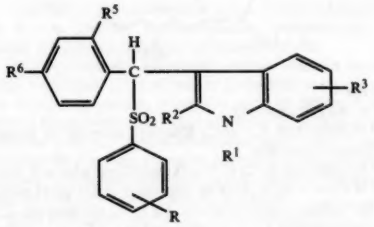
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 931,654, Aug. 8, 1978, abandoned. This application Jun. 14, 1979, Ser. No. 48,599

Int. Cl.³ C07D *209/10*

U.S. Cl. 260—326.12 R **15 Claims**

1. A [(2-R^5-4-R^6-phenyl)(1-R^1-2-R^2-5/6-R^3-3-indolyl)(R-phenylsulfonyl)]methane of the formula



wherein:

R represents one or two of hydrogen, C_1 to C_{12} alkyl, C_1 to C_3 alkoxy, halo, nitro or acetamido;

R^1 represents hydrogen, C_1 to C_{18} alkyl, C_2 to C_4 alkenyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl;

R^2 represents hydrogen, C_1 to C_3 alkyl or phenyl;

R^3 represents one or two of hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halo or nitro;

R^5 represents hydrogen, dialkylamino in which alkyl is non-tertiary C_1 to C_4 alkyl, C_1 to C_3 alkyl, C_1 to C_4 alkoxy or halo; and

R^6 represents hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halo, dialkylamino in which alkyl is non-tertiary C_1 to C_4 or N-alkylbenzylamino in which alkyl is non-tertiary C_1 to C_4 and benzyl may be substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl.

4,257,955

LANTHANIDE RARE EARTH SERIES CRYPTATE COMPOUNDS AND PROCESS FOR THE PREPARATION OF METAL CRYPTATES IN GENERAL

Otto A. Gansow, East Lansing, Mich., and Kelly B. Triplett, Stamford, Conn., assignors to Board of Trustees, Michigan State University, East Lansing, Mich.

Filed Oct. 6, 1978, Ser. No. 949,216

Int. Cl.³ C07F *5/00, 15/06, 15/04, 15/02, 13/00, 11/00, 9/00, 7/28*

U.S. Cl. 260—338 **8 Claims**

1. The process for forming a metal cryptate coordination compound which comprises:

(a) refluxing an inorganic metal salt selected from lanthanide, actinide and first row divalent d-transition metal cations containing bound water in an anhydrous polar organic solvent selected from nitriles, ketones and esters with a dehydrating agent selected from trimethylorthoformate, triethylorthoformate and propylene carbonate dissolved in the solvent which reacts with the bound water to form an alcohol in situ thus removing the bound water and forming a product mixture containing a dehydrated metal salt;

(b) reacting the dehydrated metal salt in the product mixture of step (a) with a polyoxydiazamacrobicyclic polyether cryptand ligand; and

(c) separating the encryptated metal salt from the solvent.

4,257,956

OXABICYCLOALKANE PYRETHROID INTERMEDIATES

Johannes L. M. Syrier, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 31, 1980, Ser. No. 135,405

Claims priority, application United Kingdom, Apr. 6, 1979, 12133/79

Int. Cl.³ C07D *493/04*

U.S. Cl. 260—343.21 **2 Claims**

1. 2,3-Epoxy-3,7,7-trimethyl-5-oxo-4-oxabicyclo[4.1.0]-heptane.

4,257,957

METHYL-TRIS-(4-HYDROXYCOUMARIN)SILANE

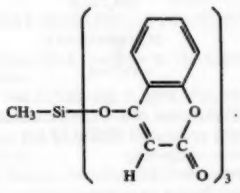
James A. Cella, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 927,288, Jul. 24, 1978, Pat. No. 4,210,596. This application Dec. 17, 1979, Ser. No. 104,425

Int. Cl.³ C07D *311/46*

U.S. Cl. 260—343.44 **1 Claim**

1. The compound



4,257,958

STABILIZED ACID ANHYDRIDES

Justin C. Powell, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed May 25, 1979, Ser. No. 42,684

Int. Cl.³ C07D *307/58, 307/89, 309/32*

U.S. Cl. 260—346.7 **22 Claims**

1. A composition stabilized against the deteriorative effect of heat comprising an anhydride of a polycarboxylic acid and as a stabilizer an inorganic boron-oxygen compound.

4,257,959

Patent Not Issued For This Number

4,257,960
PREPARATION OF FURAN COMPOUNDS

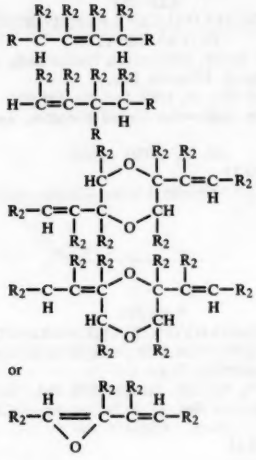
Marvin L. Peterson, Woodstown, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1980, Ser. No. 145,583
Int. Cl.³ C07D *307/36*
U.S. Cl. 260—346.11 **13 Claims**

1. A process for the preparation of a furan compound, the process comprising

(A) bringing together, under conditions suitable for furan compound formation,

(1) a compound represented by the structure



or

where

R is —OH, —OR_1 or

R_1 is an alkyl radical of 1–4 carbon atoms, and

R_2 is hydrogen or an alkyl radical of 1–4 carbon atoms,

(2) a solution comprising

(a) water as the solvent,

(b) copper having an average oxidation state between 1 and 2,

(c) a solubilizing agent for cuprous ions, soluble in water and capable of forming a water-soluble complex with cuprous ions, and

(d) 0.05–2.00 moles per liter of hydrogen ions, and

(B) separating furan compound from the resulting reaction mass.

4,257,961
PURIFICATION OF TETRAHYDROFURAN

John S. Coates, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 11, 1980, Ser. No. 158,610
Int. Cl.³ C07D *307/08*
U.S. Cl. 260—346.11 **4 Claims**

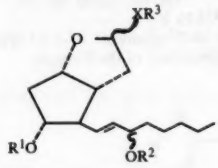
1. In the multi-stage distillation refining of tetrahydrofuran (THF) made from acetylene and formaldehyde, a method of reducing the concentration of the methacrolein, dihydrofuran, propionaldehyde and butyraldehyde impurities, the method comprising catalytically hydrogenating dry THF from one of the distillation stages at a temperature of 25°–150° C. and a hydrogen pressure of 172–1379 kPa gauge, using Raney nickel as the catalyst, and then separating THF and the resulting chemically modified impurities by subsequent distillation.

4,257,962
DERIVATIVES OF BICYCLIC LACTOLS

Tibor Szabo; Laszlo Institoris; Gabor Kovacs; Gyula Dalmadi; Bela Koszegi, and Istvan Stadler, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Sep. 15, 1978, Ser. No. 942,819
Claims priority, application Hungary, Sep. 26, 1977, CI 1771
Int. Cl.³ C07D *307/935*
U.S. Cl. 260—346.22 **4 Claims**

1. A racemic or optically active compound of the formula:



wherein

X is oxygen or sulfur;

R^1 is hydrogen, C_1 to C_4 alkanoyl, benzoyl or phenyl-substituted benzoyl;

R^2 is hydrogen or C_1 to C_4 alkanoyl; and where X is oxygen,

R^3 is C_2 to C_{40} straight or branched chain alkyl substituted by hydroxy, epoxy, amino, C_1 to C_6 alkylamino, C_1 to C_6 dialkylamino, C_1 to C_6 alkanoyloxy or C_1 to C_4 alkoxycarbonyl; cyclohexyl, phenyl unsubstituted or substituted by halogen, amino, C_1 to C_4 alkyl-substituted amino, C_1 to C_4 alkoxy, nitro, or hydroxy; C_1 to C_6 alkanoyl; allyl; or phenyl-C_1 to C_4 alkyl unsubstituted or substituted by a C_2 to C_6 alkene group; or where X is sulfur R^3 is as defined above or is C_1 to C_{40} straight or branched chain alkyl; and

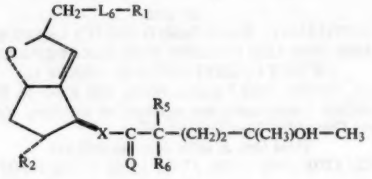
~ represents the exo- or endo-steric position in the ring and indicates an α- or β-steric position in the side chain.

4,257,963
19-HYDROXY-19-METHYL-7,8-DIDEHYDRO-PGI$_1$ COMPOUNDS

John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,720, Jul. 5, 1979, Pat. No. 4,225,507.
This application Mar. 3, 1980, Ser. No. 126,462
Int. Cl.³ C07D *307/935*
U.S. Cl. 260—346.22 **9 Claims**

1. A prostacyclin-type compound of the formula



wherein L_6 is

(1) —$(CH_2)_n$—, wherein n is one to 5, inclusive, or

(2) —CH_2—CH=CH—;

wherein Q is oxo, α—H:β—H, α—OH:β—R_4, or α—R_4:β—OH,

wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_1 is

(1) —$COOR_3$,
(2) —CH_2OH,
(3) —$CH_2N(R_7)(R_8)$,
(4) —$CO—N(R_7)(R_8)$,
(5) —$CO—NH—SO_2—R_{15}$, or
(6)tetrazolyl,
wherein R_3 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;
(g) —(p-Ph)—$CO—CH_3$,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—$CO—CH_3$,
(i) —(p-Ph)—NH—CO—(Ph),
(j) —(p-Ph)—NH—$CO—CH_3$,
(k) —(p-Ph)—NH—$CO—NH_2$,
(l) —(p-Ph)—CH=N—NH—$CO—NH_2$,
(m) β-naphthyl,
(n) —$CH_2—CO—R_{16}$,
wherein —(p-Ph)- is para-phenylene and —(Ph) is phenyl; wherein R_{16} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation; wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, and wherein R_{15} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, phenyl, phenyl-substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive,
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl,
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro, and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) —CH_2CH_2—.

4,257,964
19-HYDROXY-6,7-DIDEHYDRO-PGI$_1$ COMPOUNDS

John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,811, Jul. 5, 1979, Pat. No. 4,225,508.
This application Mar. 3, 1980, Ser. No. 126,473
Int. Cl.[3] C07D *307/935*
U.S. Cl. 260—346.22 6 Claims

1. A prostacyclin-type compound of the formula

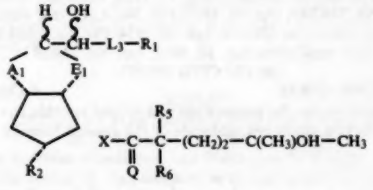
wherein L_4 is
(1) —$(CH_2)_n$—, wherein n is one to 5, inclusive,
or (2) —$(CH_2)_p—CF_2$—, wherein p is 2, 3, or 4,
wherein Q is oxo, α—H:β—H, α—OH:β—R_4, or α—R_4:β—OH,
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_1 is
(1) —$COOR_3$,
(2) —CH_2OH,
(3) —$CH_2N(R_7)(R_8)$,
(4) —$CO—N(R_7)(R_8)$,
(5) —$CO—NH—SO_2—R_{15}$, or
(6) tetrazolyl,
wherein R_3 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;
(g) —(p-Ph)—$CO—CH_3$,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—$CO—CH_3$,
(i) —(p—Ph)—NH—CO—(Ph),
(j) —(p—Ph)—NH—$CO—CH_3$,
(k) —(p—Ph)—NH—$CO—NH_2$,
(l) —(p—Ph)—CH=N—NH—$CO—NH_2$,
(m) β-naphthyl,
(n) —$CH_2—CO—R_{16}$,
wherein —(p—Ph)— is para-phenylene and —(Ph) is phenyl; wherein R_{16} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation; wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, and wherein R_{15} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, phenyl, phenyl-substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive,
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl,
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro, and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) —CH_2CH_2—.

4,257,965
19-HYDROXY-19-METHYL-5-HYDROXY-PGI COMPOUNDS

John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,720, Jul. 5, 1979, Pat. No. 4,225,507.
This application Mar. 3, 1980, Ser. No. 126,511
Int. Cl.[3] C07D *307/935*
U.S. Cl. 260—346.22 5 Claims

1. A prostacyclin-type compound of the formula



wherein A_1 is —O— (oxa) and E_1 is —CH_2—;
wherein L_3 is
(1) —$(CH_2)_n$—, wherein n is one to 5, inclusive,
(2) —$(CH_2)_p—CF_2$—, wherein p is 2, 3, or 4; or
(3) —$CH_2—C^1$=CH—;
wherein Q is oxo, α-H:β-H, α-OH:β-R_4, or α-R_4:β-OH,
wherein R_1 is
(1) —$COOR_3$,
(2) —CH_2OH,
(3) —$CH_2N(R_7)(R_8)$,
(4) —$CO—N(R_7)(R_8)$,
(5) —$CO—NH—SO_2—R_{15}$, or

(6) tetrazolyl,

wherein R_3 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;

(g) —(p-Ph)—CO—CH_3,

(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,

(i) —(p-Ph)—NH—CO—(Ph),

(j) —(p-Ph)—NH—CO—CH_3,

(k) —(p-Ph)—NH—CO—NH_2,

(l) —(p-Ph)—CH=N--NH—CO—NH_2,

(m) β-naphthyl,

(n) —CH_2—CO—R_{16},

wherein —(Ph)— is phenylene and —(Ph) is phenyl; wherein R_{16} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation; wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, and wherein R_{15} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, phenyl, phenyl-substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive, wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro, and wherein ~ refers to substituents in the α or β configuration or a mixture thereof; and

wherein X is

(1) trans-CH=CH—,

(2) cis-CH=CH—,

(3) —C≡C—, or

(4) —CH_2CH_2—.

4,257,966

PREPARATION OF VICINAL EPOXIDES

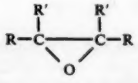
Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 934,667, Aug. 17, 1978, which is a division of Ser. No. 845,183, Oct. 25, 1977, Pat. No. 4,111,965, which is a division of Ser. No. 459,628, Apr. 10, 1974, Pat. No. 4,069,234. This application Sep. 10, 1979, Ser. No. 73,819

Int. Cl.³ C07D *301/02*

U.S. Cl. 260—348.16 **6 Claims**

1. A process for the preparation of a vicinal epoxide having 2 to 30 carbon atoms per molecule of the general formula



wherein each R and each R′ are individually selected from the group consisting of hydrogen and hydrocarbyl radical groups having 1 to 10 carbon atoms and wherein both R′ radicals in said epoxide can represent a divalent aliphatic hydrocarbon radical which together with the oxirane group in said epoxide can form a cycloaliphatic nucleus, which comprises heating the corresponding carbonate ester having the general formula

wherein R and R′ are as defined above, in the presence of a catalytic amount of a metal salt catalyst selected from the group consisting of the halides, sulfates and carboxylates having 1 to 20 carbon atoms of tin.

4,257,967

CATALYST COMPOSITION AND METHOD FOR OXIDATION OF ETHYLENE TO ETHYLENE OXIDE AND METHOD OF CATALYST MANUFACTURE

Tsunesuke Kajimoto, Kamakura, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Filed May 4, 1979, Ser. No. 36,066

Claims priority, application Japan, Nov. 1, 1978, 53-134989

Int. Cl.³ C07D *301/10*; B01J *23/10, 23/50, 27/20*

U.S. Cl. 260—348.34 **41 Claims**

1. A catalyst composition for the oxidation of ethylene to ethylene oxide which comprises the combination of reduced silver (A) and at least one carbonate (B) of a metal selected from the group consisting of rare earth metals and yttrium, said carbonate being prepared by the reaction of a chloride of a metal selected from the group consisting of the rare earth metals and yttrium and mixtures thereof with a carbonate or bicarbonate of an alkali metal or mixture thereof, said reduced silver (A) and said carbonate (B) being supported together with at least one salt (C) of a metal selected from the group consisting of the alkali and alkaline earth metals and mixtures thereof on a catalyst carrier (D) having a surface area of less than about 10 m^2/g.

4,257,968

OXIDATION OF PHENOL TO P-BENZOQUINONE IN ACETONITRILE/METHANOL COSOLVENT

Edward L. Reilly, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 4, 1979, Ser. No. 81,806

Int. Cl.³ C07C *46/08*

U.S. Cl. 260—396 R **9 Claims**

1. In a process for making p-benzoquinone by contacting phenol and oxygen or an oxygen containing gas in the presence of a copper salt catalyst, the improvement which comprises contacting the phenol, the oxidant, and the catalyst in the presence of a cosolvent system of acetonitrile and methanol, the weight ratio of acetonitrile to methanol being about 1 to 20:1.

4,257,969

16,17-DIHYDROXYPREGNENE-21-CARBOXYLIC ACIDS AND DERIVATIVES

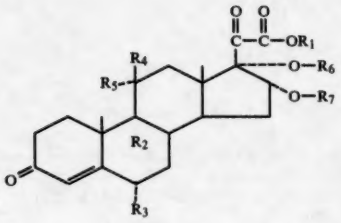
Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 23, 1980, Ser. No. 114,475

Int. Cl.³ C07J *9/00*

U.S. Cl. 260—397.1 **9 Claims**

1. A steroid having the formula



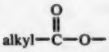
or the 1,2-dehydro derivative thereof, wherein

R_1 is alkyl of 1 to 10 carbon atoms, aryl, or arylalkyl;

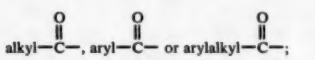
R_2 is is hydrogen or halogen;

R_3 is hydrogen, fluorine or methyl;

R_4 is chlorine, fluorine, hydroxy or



and R_5 is hydrogen, or R_4 and R_5 together are =O; and R_6 and R_7 each is independently hydrogen,



wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 6 carbon atoms and the term "aryl" refers to phenyl or phenyl substituted with one or more halogen, alkyl and alkoxy groups.

4,257,970

NOVEL SULFONYL IMIDE INTERMEDIATES

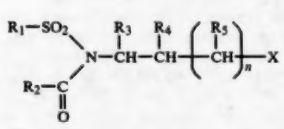
Donald A. Tomalia, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 17, 1979, Ser. No. 76,112

Int. Cl.³ C07C *143/74, 143/90*

U.S. Cl. 260—401 **8 Claims**

1. An N-(haloalkyl)sulfonyl imide represented by the formula I



I

wherein

(1) R_1 and R_2 are independently aryl, alkaryl, aralkyl or alkyl groups having up to 20 carbon atoms

(2) R_3, R_4 and R_5 are independently hydrogen or a methyl group;

(3) n is the integer 0 or 1; and

(4) X in a chloro, bromo or iodo group.

4,257,971

19-HYDROXY-PG$_2$ ANALOGS

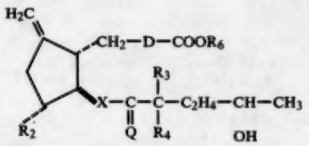
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,899, Apr. 2, 1979, Pat. No. 4,228,104. This application Oct. 26, 1979, Ser. No. 88,446

Int. Cl.³ C07C *177/00*

U.S. Cl. 260—404 **1 Claim**

1. A compound of the formula



wherein D is

(1) cis-CH=CH—CH_2—$(CH_2)_g$—CH_2—,

(2) cis-CH=CH—CH_2—$(CH_2)_g$—CF_2—,

wherein g is zero, one, two, or three;

wherein Q is α-OH:β-R_5 or α-R_5:β-OH,

wherein R_5 is hydrogen or methyl,

wherein R_6 is

(a) hydrogen,

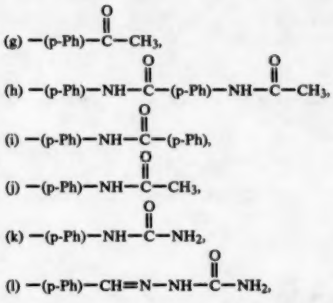
(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;



(m) β-naphthyl,

(n) —CH_2—CO—R_{28},

wherein Ph is phenyl, p-Ph is inter-paraphenylene, and R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation;

wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl;

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro and x is trans-CH=CH—.

4,257,972

CATALYST FOR PRODUCING POLYHYDRIC ALCOHOLS AND DERIVATIVES

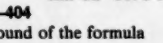
Jose L. Vidal, Charleston, and Wellington E. Walker, Sissonville, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 958,383, Nov. 7, 1978, Pat. No. 4,180,517, which is a continuation-in-part of Ser. No. 880,080, Feb. 22, 1978, abandoned. This application Jul. 31, 1979, Ser. No. 62,357

Int. Cl.³ C07F *15/00*

U.S. Cl. 260—429 R **3 Claims**

1. A rhodium carbonyl phosphido cluster compound which is the combination of an anion of the following empirical formula:



associated with a cation.

4,257,973
PROCESS OF MAKING ACIDS OR ESTERS FROM UNSATURATED COMPOUNDS

Joseph J. Mrowca, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 5, 1971, Ser. No. 196,177
Int. Cl.³ C07C *51/14, 67/38*
U.S. Cl. 260—410.9 R **32 Claims**

1. A process for making compounds containing carboxylic acid or carboxylic ester groups which comprises reacting an aliphatically unsaturated compound with carbon monoxide and with a hydroxy compound which is water or a primary or a secondary alcohol in the presence of a catalytic amount of a catalyst system composed of a palladium compound having the formula:

$$(PR_3)_2PdXY$$

wherein

X is chlorine or bromine,

Y is hydrogen, chlorine, bromine, lower alkyl, aralkyl, acyl of 2 to 4 carbon atoms or aryl of up to 12 carbons, and

each R is selected from lower alkyl, cycloalkyl of 3 to 8 carbon atoms, lower alkoxy or aryl of up to 12 carbon atoms substituted with up to 3 halogen atoms or lower alkoxy groups, aralkyl groups of up to 12 carbon atoms, arylthio groups or aryloxy groups, each of up to 12 carbon atoms, lower alkylthio, di(lower alkyl)amino, pyrrolidino, piperidino groups and vinyl groups,

with the proviso that not more than one aromatic group attached to phosphorus has a substituent in a sterically hindering position, and

from 0.5 to 5 moles of a promoter per mole of said palladium compound selected from chlorides of Ti,-Tl,[Ni, Fe,] Cr,[Co,] Pd, Zn, Mn or Cu and halogen tin compounds;

said unsaturated compounds being subject to the following provisos:

(i) ethylenic groups must have at least two hydrogen substituents

(ii) the unsaturated groups are not conjugated with other aliphatic unsaturation,

(iii) halogen or hydroxyl, if present, must be removed by at least 2 carbon atoms from the double bond, and

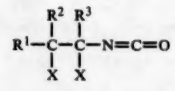
(iv) the unsaturated compounds are free of amine groups.

4,257,974
PROCESS FOR THE PREPARATION OF α,β-DIHALOALKYL ISOCYANATES

Karl-Heinz Koenig, Frankenthal; Heinz-Guenter Oeser, and Karl-Heinz Feuerherd, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

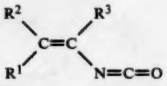
Filed Oct. 18, 1979, Ser. No. 85,962
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1978, 2846184
Int. Cl.³ C07C *119/042, 119/045, 119/048*
U.S. Cl. 260—453 A **1 Claim**

1. A process for the preparation of an α,β-dihaloalkyl isocyanate of the formula I



I

where R^1, R^2 and R^3 are identical or different and each is hydrogen, a saturated aliphatic radical of 1 to 10 carbon atoms, a cycloaliphatic radical of 3 to 12 carbon atoms, an araliphatic radical of 7 to 11 carbon atoms or an aromatic radical of 6 to 10 carbon atoms, or R^1 and R^2 together with the carbon atom on which they are present as substituents are cycloalkyl of 3 to 7 ring members, and X is halogen, wherein an α,β-unsaturated alkyl isocyanate of the formula II



II

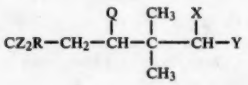
where R^1, R^2 and R^3 have the above meanings, is reacted with a halogen of the formula X_2 at from −35° to +90° C. in the presence of an organic solvent which is inert under the reaction conditions.

4,257,975
4-HALO-3,3-DIMETHYL-6,6,6-TRIHALOHEXANOATE INTERMEDIATES

Nazim Punja, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 925,239, Jul. 17, 1978, Pat. No. 4,198,347, which is a division of Ser. No. 684,956, May 10, 1976, abandoned. This application Sep. 25, 1979, Ser. No. 78,834
Claims priority, application United Kingdom, May 16, 1975, 20884/75; May 16, 1975, 20885/75; May 16, 1975, 20893/75
Int. Cl.³ C07C *69/63, 121/16, 121/20*
U.S. Cl. 260—465.4 **3 Claims**

1. A compound of the formula:



wherein X and Y are independently selected from cyano and alkoxycarbonyl containing from 1 to 4 carbon atoms in the alkoxy group, and Q, R and Z are independently selected from chlorine and bromine provided that Q is always bromine when either Z or R is bromine.

4,257,976
RESOLUTION PROCESS USING L OR D N-METHYL-EPHEDRINE

Charles Pavan, Nogent-sur-Marne, and Jacques Bulidon, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Filed Nov. 20, 1979, Ser. No. 96,028
Claims priority, application France, Dec. 8, 1978, 78 34591
Int. Cl.³ C07C *61/37;* C07B *19/00*
U.S. Cl. 260—501.17 **9 Claims**

9. A compound selected from the group consisting of D N-methyl-ephedrine L-trans chrysanthemate, L N-methyl-ephedrine D-trans chrysanthemate, L N-methyl-ephedrine D-cis chrysanthemate and D N-methyl-ephedrine L-cis chrysanthemate.

4,257,977
2-NITRO-4'-AMINODIPHENYLAMINE-2',4-DISULFONIC ACID AND PROCESS FOR ITS PREPARATION

Michael Yelland, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 14, 1977, Ser. No. 768,623
Claims priority, application United Kingdom, Mar. 10, 1976, 9515/76
Int. Cl.³ C07C *143/58*
U.S. Cl. 260—510 **3 Claims**

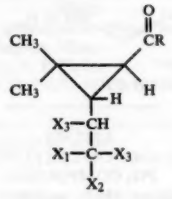
1. 2-Nitro-4'-aminodiphenylamine-2',4-disulphonic acid.

4,257,978
NOVEL POLYHALOGENATED CYCLOPROPANE CARBOXYLIC ACID DERIVATIVES

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 834,573, Sep. 19, 1977, Pat. No. 4,179,575. This application Jun. 25, 1979, Ser. No. 51,348
Claims priority, application France, Sep. 21, 1976, 76 28279; Jul. 19, 1977, 77 22078
Int. Cl.[3] C07C 53/50
U.S. Cl. 260—544 L 8 Claims

1. A compound of the formula



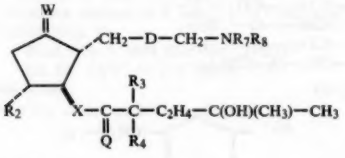
wherein X_1 is selected from the group consisting of hydrogen, fluorine, chlorine and bromine, X_2 is selected from the group consisting of fluorine, chlorine and bromine, X_3 is selected from the group consisting of chlorine, bromine and iodine and R is halogen; in any of the possible diastereoisomeric forms.

4,257,979
2-DECARBOXY-2-AMINOMETHYL-19-HYDROXY-19-METHYL-PG COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,878, Apr. 2, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 133,201
Int. Cl.[3] C07C 91/02, 91/06, 91/40
U.S. Cl. 564—454 263 Claims

1. A compound of the formula



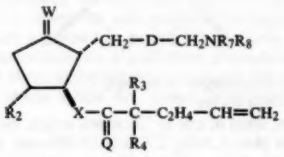
wherein D is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—CH_2—CH_2—,
(4) trans—$(CH_2)_3$—CH=CH—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(6) —$(CH_2)_3$—CH_2—CF_2—,
(7) —$(CH_2)_3$—O—CH_2—,
(8) —$(CH_2)_2$—O—$(CH_2)_2$,
(9) —CH_2—O—$(CH_2)_3$—,
(10) —(m-Ph)—$(CH_2)_2$—, or
(11) —(m-Ph)—O—CH_2—,
wherein —(m-Ph)— is inter-meta-phenylelne, and wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different;
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein W is oxo, methylene, α-OH:β-H, or α-H:β-OH; and
wherein X is cis- or trans—CH=CH—, —C≡C—, or —CH_2CH_2—.

4,257,980
2-DECARBOXY-2-AMINOMETHYL-19,20-DIDEHYDRO-13,14-DIHYDRO-PG_1 COMPOUNDS

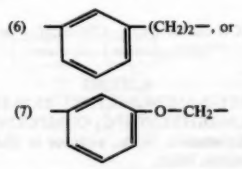
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 26,066, Apr. 2, 1979. This application Oct. 17, 1979, Ser. No. 85,630
Int. Cl.[3] C07C 91/02, 91/06, 91/40
U.S. Cl. 564—336 1 Claim

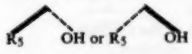
1. A compound of the formula



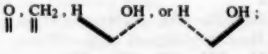
wherein D is
(1) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(2) —$CH_2)_3$—CH_2—CF_2—,
(3) —$(CH_2)_3$—O—CH_2—,
(4) —$(CH_2)_2$—O—$(CH_2)_2$—,
(5) —CH_2—O—$(CH_2)_3$—,



wherein g is zero, one, two, or three; wherein Q is



wherein R_5 is hydrogen or methyl, wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl; wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; wherein W is



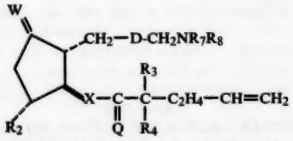
and wherein X is —CH_2CH_2—.

4,257,981
2-DECARBOXY-2-AMINOMETHYL-19,20-DIDEHYDRO-PG$_2$ COMPOUNDS

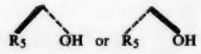
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 26,066, Apr. 2, 1979. This application Oct. 17, 1979, Ser. No. 85,627
Int. Cl.[3] C07C *91/02, 91/06, 91/40*
U.S. Cl. 564—454 1 Claim

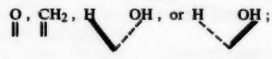
1. A compound of the formula



wherein D is
(1) cis—CH=CH—CH$_2$—(CH$_2$)$_g$—CH$_2$—,
(2) cis—CH=CH—CH$_2$—(CH$_2$)$_g$—CF$_2$—,
(3) cis—CH$_2$—CH=CH—CH$_2$—CH$_2$—,
(4) trans—(CH$_2$) 3—CH=CH—,
wherein g is zero one, 2, or 3,
wherein Q is



wherein R_5 is hydrogen or methyl,
wherein R_7 and R_8 are
hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different. wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl; wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein W is



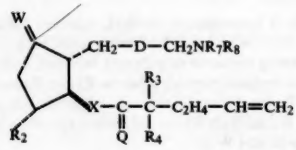
and wherein X is cis- or trans—CH=CH— or —C≡C—.

4,257,982
2-DECARBOXY-2-AMINOMETHYL-19,20-DIDEHYDRO-13,14-DIHYDRO-PG$_2$ COMPOUNDS

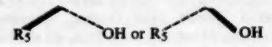
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 26,066, Apr. 2, 1979, Pat. No. 4,228,104. This application Oct. 17, 1979, Ser. No. 85,628
Int. Cl.[3] C07C *87/45, 87/62, 91/06*
U.S. Cl. 564—453 1 Claim

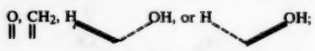
1. A compound of the formula



wherein D is
(1) cis—CH=CH—CH$_2$—(CH$_2$)g—CH$_2$—,
(2) cis—CH=CH—CH$_2$—(CH$_2$)g—CF$_2$—,
(3) cis—CH$_2$—CH=CH—CH$_2$—CH$_2$—,
(4) trans—(CH$_2$)$_3$—CH=CH—,
wherein g is zero, one, 2, or 3, wherein Q is



wherein R_5 is hydrogen or methyl, wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl; wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; wherein W is



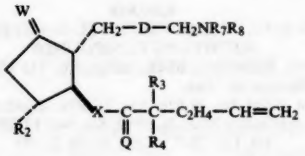
and wherein X is —CH$_2$CH$_2$—.

4,257,983
2-DECARBOXY-2-AMINOMETHYL-19,20-DIDEHYDRO-PG$_1$ COMPOUNDS

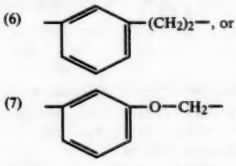
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 26,066, Apr. 2, 1979, Pat. No. 4,228,104. This application Oct. 17, 1979, Ser. No. 85,629
Int. Cl.[3] C07C *91/02, 91/06, 91/40*
U.S. Cl. 564—346 1 Claim

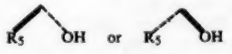
1. A compound of the formula



wherein D is
(1) —(CH$_2$)$_3$—(CH$_2$)g—CH$_2$—,
(2) —(CH$_2$)$_3$—CH$_2$—CF$_2$—,
(3) —(CH$_2$)$_3$—O—CH$_2$—,
(4) —(CH$_2$)$_2$—O—(CH$_2$)$_2$—,
(5) —CH$_2$—O—(CH$_2$)$_3$—,

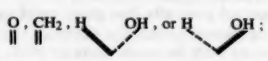


wherein g is zero, one, two, or three;
wherein Q is



wherein R_5 is hydrogen or methyl,
wherein R_7 and R_8 are
hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different,
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein W is



and wherein X is cis- or trans—CH=CH— or —CH≡C—.

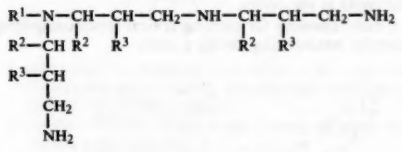
4,257,984

MONOTERTIARYMONOSECONDARYDIPRIMARYTETRAMINE AND MONOTERTIARYMONOSECONDARYDINITRILODIAMINES

Stuart A. Harrison, Minneapolis, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Apr. 4, 1977, Ser. No. 784,381
Int. Cl.³ C07C *87/20, 87/24, 87/28, 87/50*
U.S. Cl. 564—336 **24 Claims**

1. A non-linear monotertiarymonosecondarydiprimarytetramine having the structural formula



wherein R^1 is an organic moiety having from 4 to 40 carbon atoms and R^2 is selected from the group consisting of alkyl and alkenyl radicals having from 1 to 40 carbon atoms, hydrogen, phenyl, phenylalkyl and alkylphenyl derivatives and mixtures thereof, and R^3 is hydrogen or methyl and mixtures thereof.

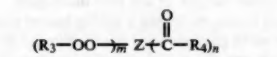
4,257,985

COMPOUNDS BY ADDITION OF HYDROPEROXIDES TO α-β-UNSATURATED KETONES

Wilbur H. McKellin, Buffalo, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 7, 1968, Ser. No. 727,335
Int. Cl.³ C07C *49/213, 49/04, 45/64*
U.S. Cl. 568—308 **18 Claims**

7. Keto-peroxy compounds of the formula:



where:

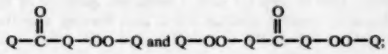
(a) said compound includes at least one peroxy (—OO—) group and at least one keto

group;

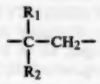
(b) m and n are each integers equal to 0–2 and m+n equals 2;

(c) Z is a biradical selected from Q, Q—OO—Q,

Q—OO—R_5—OO—Q,



(d) Q is the biradical



where the t-carbon atom is joined to a peroxy oxygen;

(e) said

group has at least one valence joined to a carbon atom α to the t-carbon atom in Q;

(f) R_1, R_2 and R_4 are each selected from alkyl having 1–12 carbons; phenalkyl having 7–20 carbons; phenyl; and cycloalkyl having 4–20 carbons, R_1 and R_2 not both being phenyl;

(g) R_3 is selected from C_4–C_{10} alkyl, cycloalkyl, phenalkyl and corresponding radicals containing a halo, hydroxy or alkylperoxy substituent, said radicals affording a t-carbon atom which is joined to a peroxy oxygen atom; and

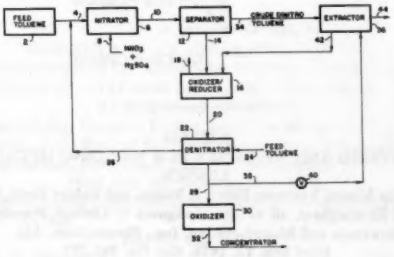
(h) R_5 is selected from C_7–C_{20} alkylene, alkenylene, alkynylene, and alkylenephenalkylene biradicals affording two t-carbon atoms which are joined to different peroxy groups.

4,257,986

PROCESS FOR REFINING AQUEOUS ACID MIXTURES UTILIZED IN NITRATION OF AROMATICS

Barton Milligan, Coplay, Pa., and Der-Shing Huang, Carmichael, Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 2, 1979, Ser. No. 8,906
Int. Cl.³ C07C *79/10*
U.S. Cl. 568—934 **8 Claims**



1. In a process for the manufacture of a nirotoluene compound by reacting toluene with an aqueous acid mixture comprising nitric acid and sulfuric acid under conditions sufficient to effect nitration thereof and form a nitrotoluene compound and a spent aqueous acid fraction and then recovering the nitrotoluene compound from the spent aqueous acid fraction, the improvement for refining the spent aqueous acid fraction which comprises the following steps:

(a) contacting said spent aqueous acid with at least a stoichiometric quantity of an oxidizing or reducing agent under conditions effective for destroying contaminant nitrous acid contained therein; and

(b) contacting the spent aqueous acid substantially free of nitrous acid in step (a) with a sufficient quantity of feed tôluene to remove residual nitric acid leaving a mixture consisting essentially of sulfuric acid and contaminant organic impurities.

4,257,987

LOWER ALKYL DI PROPARGYL PHOSPHATES

Günter Arend, Dormagen; Wolfgang Behrenz, Overath, and Hans-Dieter Block, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

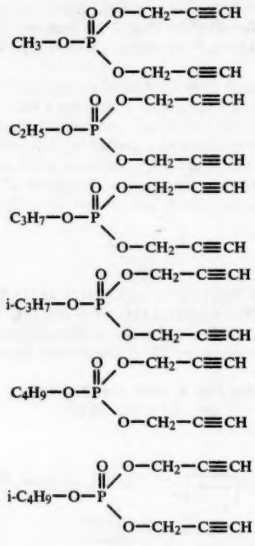
Division of Ser. No. 910,302, May 26, 1978, abandoned. This application Sep. 17, 1979, Ser. No. 76,053

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1977, 2727479

Int. Cl.[3] **C07F** *9/113;* **A01N** *57/12, 57/14, 57/16*

U.S. Cl. 260—956 **7 Claims**

1. A phosphoric acid ester selected from the group consisting of



and

4,257,988

METHOD AND ASSEMBLY FOR MOLDING OPTICAL LENSES

R. Jay Matos, Vestavia; Eliseo J. Matos, and Robert Blaik, both of Birmingham, all of Ala., assignors to Optical Warehouse Showroom and Manufacturing, Inc., Birmingham, Ala.

Filed Sep. 12, 1978, Ser. No. 941,797

Int. Cl.[3] **B29D** *11/00*

U.S. Cl. 264—1.1 **22 Claims**

1. A method of molding anoptical lens comprising the steps of:

arranging a first generally disc shaped mold part with an outer surface thereof supported by a shelf of a retainer ring,

arranging on the inner surface of the first mold part opposite the said surface and near the periphery thereof a pair of adjacent gaskets, one of which is a hard spacer which maintains its shape at elevated temperatures under load except for elastic deformation, and the other is a soft gasket having the property of softening so as to creep under load at elevated temperatures, and arranging the two gaskets adjacent to each other so that the inside diameter of each forms a part of the cavity,

arranging a second generally disc shape mold part with an inner surface thereof against the gasket so as to define an enclosed cavity with the inside diameter of the gasket and the said inner surface of the first mold part,

exerting a resilient force to urge the two mold parts toward each other, so as to hold the two mold parts and the gasket together as they form said cavity by a means which is positively located relative to the retainer means to exert the force precisely centered along the axis of the retainer ring,

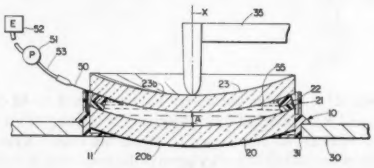
filling said cavity with a liquid capable of being converted into a state in which, upon being heated, it shrinks in volume and becomes hard and insoluble at room temperature,

heating the mold assembly with the said liquid filling the said cavity,

and wherein the magnitude of the resilient force and the creeping characteristic of the gasket are such that as the liquid shrinks during the heating step, the two mold parts move toward each other to maintain contact with the liquid throughout the said conversion and hardening of the liquid in the cavity.

15. A mold assembly for molding optical lenses comprising:

an annular retainer ring having a shelf,



a first generally disc shaped mold part poistively positioned on the retainer and supported by such a shelf,

a set of a pair of annular resilient gaskets positioned against the inner surface of the first mold part near the periphery thereof, said set being of assentially uniform thickness, one of said gaskets of the set being a hard spacer which maintains its shape at elevated temperatures under load except for elastic deformation, and the other being a soft gasket having the property of softening so as to creep under load at elevated temperatures,

a second generally disc shaped mold part positioned with an inner surface against the gasket set so as to define an enclosed cavity with the inside diameter of the gasket set and the inner surface of the first mold part,

and resilient means including a spring biased arm for urging the two mold parts toward each other so as to hold the mold parts and the gasket together as they form the said cavity, said resilient means including means for positively locating the spring biased arm, relative to the retainer ring, to apply the resilient force precisely centered on the axis of the retainer ring,

whereby when a liquid located in the cavity shrinks and hardens at elevated temperatures, the magnitude of the resilient force and the creeping characteristic of the gasket permit the mold parts to move uniformly toward each other to maintain contact with the liquid as the liquid hardens in the cavity.

4,257,989

HUMIDIFIER

Kyoichi Nishikawa, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

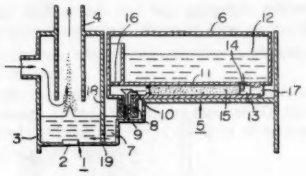
Filed Feb. 22, 1979, Ser. No. 13,904

Int. Cl.[3] **B01F** *3/04*

U.S. Cl. 261—4 **6 Claims**

1. A humidifier, comprising:

a housing having means defining a misting chamber therein for containing an amount of treated water to be misted;
a mist conduit extending upwardly from the misting chamber and opening through the top of the housing for discharge of mist from the housing;
a detachable water storage tank supported in the housing for storing a supply of untreated water to be misted, and having a water outlet;
said water storage tank having an ion exchange chamber on the bottom thereof with one end in communication with the water outlet from the water storage tank and the other end in communication with the misting chamber, said ion exchange chamber also comprising a water passage for flow of water from the storage tank to the misting chamber;



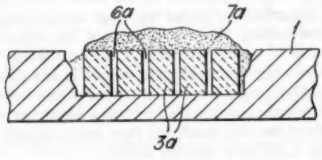
a removable ion exchange resin layer in the water passage for treating water flowing therethrough from the storage tank to the misting chamber;
ultrasonic vibration means in the misting chamber for misting the water therein;
a transparent viewing window in a wall of the water passage for visual inspection of the resin layer; and
valve means in said other end of the water passage operable to close when the storage tank is removed from the housing and openable when the storage tank is placed in operative position in the housing, whereby the storage tank may be removed for inspection and servicing of the storage tank and ion exchange chamber.

4,257,990

REFRACTORY MATERIALS

William O. Thomas, and Robin Hill, both of Port Talbot, Wales, assignors to Goricon Metallurgical Services Limited, Bridgend, Wales

Filed Mar. 6, 1978, Ser. No. 883,903
Int. Cl.³ F27D *1/16*
U.S. Cl. 264—36 **14 Claims**



1. A method of treating a ferrous metal structure formed with a cavity by fitting the cavity with refractory brickwork which substantially fills the cavity to the level of said surface, but has a periphery which defines a gap between the brickwork and the ferrous metal of the structure, in which method the periphery of the brickwork is joined to the ferrous metal structure by an aluminous slag produced in contact with the brickwork in the gap by an exothermic reaction of a composition containing from about 14–25 percent by weight metallic aluminum; 45–82 percent by weight oxidizing agent for said aluminum; 0–40 percent by weight particulate refractory material; 0–10 percent by weight flux and 0–6 percent by weight alkali metal salt; said proportions being adjusted to provide a flowable material which will flow into spaces and gaps, and allowing said slag to solidify within said gap, said reaction reaching a temperature such that, before said solidification, the slag in the jointing space is at least at a bond-forming temperature for the brickwork and the ferrous metal of the structure.

4,257,991

METHOD OF AND A REGULATOR FOR ADJUSTING THE CAPACITY AND THE DIAMETER OF AN ELECTRIC CONDUCTOR

Kari J. Kirjavainen, Helsinki, Finland, assignor to Oy Nokia AB, Finland

Filed Dec. 29, 1978, Ser. No. 974,559
Claims priority, application Finland, Jan. 2, 1978, 780004
Int. Cl.³ B29D *27/00*; B29F *3/10*; G01B *21/12*; G01N *27/22*
U.S. Cl. 264—40.6 **4 Claims**

1. A method of adjusting the capacity and the diameter of an electric conductor (**19**) comprising a metal wire (**10**) and an insulation (**11**) of foamed plastics material provided around said wire in an extruder press (**1**) which includes an adjustably rotating feed screw (**5**) for supplying foamable plastics material through an extrusion head (**7**) through which the wire is passed, and adjustable heating means (**8**) for heating said foamable plastics material; comprising the steps of:
measuring the conductor capacity (C_m) of the insulated conductor (**19**) downstream of said extrusion head (**7**) and generating a signal related thereto, comparing said measured conductor capacity signal with a signal related to a predetermined conductor capacity (C_a) and generating a signal related to the deviation (ΔC) therebetween;
measuring the diameter (D_m) of the insulated conductor (**19**) downstream of said extrusion head (**7**) and generating a signal related thereto, comparing said measured conductor diameter signal with a signal related to a predetermined diameter (D_a) and generating a signal related to the deviation (ΔD) therebetween;
utilizing both of the signals related to the deviations (ΔC) and (ΔD) to adjust the rotation speed (n) of said feed screw (**5**); and
utilizing both of the signals related to the deviations (ΔC) and (ΔD) to adjust the temperature (T) of said heating means (**8**).

4,257,992

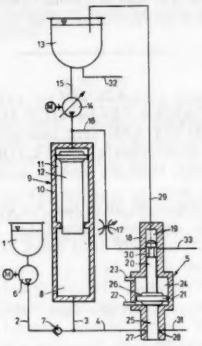
METHOD AND AN APPARATUS FOR THE PRODUCTION OF ARTICLES WHICH CONSIST OF FILLER-CONTAINING SYNTHETIC MATERIAL, IN PARTICULAR OF FOAM

Klaus Schulte; Heinrich Ersfeld, and Hans Wirtz, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 15, 1979, Ser. No. 66,747
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837425
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—45.3 **7 Claims**

1. In a method of producing articles which consist of filler-containing synthetic material, in particular a foam, wherein flowable reactants, at least one of which has previously been charged with filler, are injected into a mixing zone under predetermined injection pressures, wherein the reaction mixture is subsequently introduced into a mold, the improvement comprising exerting a pressure corresponding to the injection pressure, at least, on the filler-containing reactant, even during pauses at which time mixing does not take place by applying a pressure corresponding to the injection pressure to the hydraulic fluid whose flow is produced continuously and whose pressure is allowed to act continuously on the filler-containing reactant and thereby conveys it into the mixing zone during

the mixing period, and wherein the flow of hydraulic fluid is recirculated during pauses corresponding to the period during



which there is no reactant flow until the time when the reactant enters the mixing zone.

4,257,993

METHOD OF PRODUCING FIBRE-REINFORCED CONCRETE AND SHAPED PARTS PRODUCED BY THIS METHOD

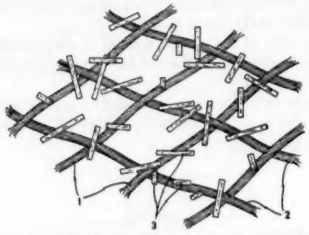
H. Schemel, Sommerwies, 7622 Schiltach, Fed. Rep. of Germany

Filed Nov. 30, 1978, Ser. No. 964,938

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2753858

Int. Cl.[3] **D04H** *1/20*

U.S. Cl. 264—112 **11 Claims**



1. A method of manufacturing a reinforced concrete, comprising the steps of producing a concrete recipe by combining cement, sand, aggregate and water; providing a mesh of fibers extending in a plane; bonding to said mesh a plurality of reinforcing fibers; embedding said mesh with bonded reinforcing fibers intact into said concrete recipe; and hardening said concrete recipe with said mesh and bonded reinforcing fibers therein.

4,257,994

METHOD AND APPARATUS FOR INJECTION MOLDING SOLID STEEL-BANDED PRESS-ON INDUSTRIAL RUBBER TIRES

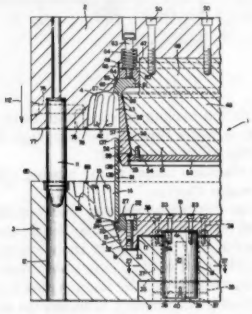
Raymond F. Leblanc; Donald M. Taylor, both of North Canton, and Robert W. Hartney, Akron, all of Ohio, assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 11, 1980, Ser. No. 120,494

Int. Cl.[3] **B29C** *1/00;* **B29D** *3/00;* **B29G** *5/02*

U.S. Cl. 264—102 **41 Claims**

1. In a method of injection molding and curing rubber compound with a steel band in a cavity formed in a mold to bond rubber injected into the cavity to the band during curing to form a solid steel-banded industrial rubber tire; the steps of providing separated top and bottom mold plate members having cavity portions therein; locating in recesses formed in respective plate members top and bottom hardened steel bite rings having conical circumferential surfaces which are complementary to conical surfaces formed in said recesses; providing annular V-shaped projections on said bite rings; biasing said top bite ring away from said top plate member conical recess portion; inserting a steel band in the bottom mold plate member cavity portion; piloting said steel band on the bottom bite ring during insertion to a position concentric with the bottom mold plate cavity portion; relatively moving said top and bottom mold plate members toward each other to mate said plate members and form a closed mold cavity; during said relative movement piloting said biased top bite ring into concentric engagement with the upper end of said steel band; meanwhile engaging said top and bottom bite ring annular V-formations with the ends of said steel band and wedge seating by band metal deformation said V-shaped formations into the metal band ends to seal the bite rings against the band ends; meanwhile seal-pressure-seating said conical bite ring surfaces in said plate member conical recess portions, and also pressure-mating parting faces of said top and bottom mold plates; holding the steel band under pressure against interior distortion; pressure injecting rubber compound at compound curing temperature into the cavity formed by the plate member cavity portions and the steel band; curing the injected rubber and maintaining molding pressure on the mated mold plate members and the seated and sealed bite rings and steel band during curing; maintaining the temperature of the injected rubber compound at its curing temperature during curing; then after curing, separating the mold plate members, and during initial separation knocking the cured steel-banded tire out of the top mold plate member cavity; then releasing distortion preventing pressure from the steel band; and then removing said tire from the bottom mold plate member cavity.



4,257,995

PROCESS FOR PREPARING PARTICLE BOARD AND POLYISOCYANATE-PHOSPHORUS COMPOUND RELEASE AGENT COMPOSITION THEREFOR

Alexander McLaughlin, Meriden; Reinhard H. Richter, North Haven, both of Conn., and Harold E. Reymore, Jr., Richmond, Va., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 35,647, May 3, 1979, which is a continuation-in-part of Ser. No. 947,209, Sep. 29, 1978, abandoned. This application Mar. 26, 1980, Ser. No. 134,315

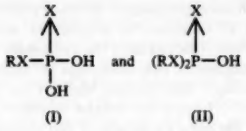
Int. Cl.[3] **B29J** *5/02;* **C08G** *18/28;* **C08L** *1/02*

U.S. Cl. 264—122 **43 Claims**

1. In a process for the preparation of particle board wherein

particles of organic material capable of being compacted are contacted with a polyisocyanate composition and the treated particles are subsequently formed into boards by the application of heat and pressure, the improvement which comprises contacting said particles, in addition to the treatment with said polyisocyanate composition, with from about 0.1 to about 20 parts, per 100 parts by weight of said polyisocyanate, of a phosphate selected from the class consisting of

(a) acid phosphates of the formulae

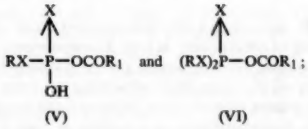


(I) (II)

and the ammonium, alkali metal, alkaline earth metal and amine salts thereof;

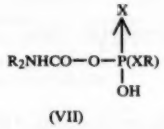
(b) pyrophosphates represented by those derived from the acid phosphates (I) and (II) and mixtures of (I) and (II);

(c) The O-monoacyl derivatives of the acid phosphates (I) and (II) having the formulae



(V) (VI)

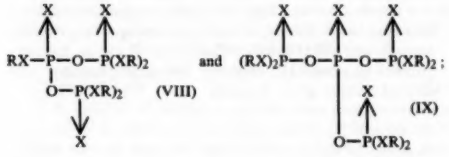
(d) carbamoyl phosphates having the formula



(VII)

and the ammonium, alkali metal, alkaline earth metal and amine salts of the compounds of formula (VII);

(e) branched polyphosphates of the formulae



(VIII) (IX)

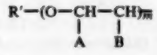
(f) polyphosphates corresponding to the general formula

(X)

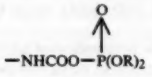
including the cyclometaphosphates (n=3); and

(g) mixtures of two or more of said compounds;

wherein, in the various formulae shown above, each R is independently selected from the class consisting of alkyl having at least 3 carbon atoms, alkenyl having at least 3 carbon atoms, aryl, aryl substituted by at least one alkyl, alkyl substituted by from 1 to 2 acyloxy groups wherein the acyl group is the residue of an aliphatic monocarboxylic acid having at least 2 carbon atoms, and



wherein R′ is selected from the class consisting of alkyl, aryl and aryl substituted by at least one alkyl, one of A and B represents hydrogen and the other is selected from the class consisting of hydrogen, methyl, chloromethyl and 2,2,2-trichloroethyl, and m is a number having an average value from 1 to 25; provided that when one of the R's in Formulae (II), (VI), (VIII) an (IX) is alkyl having at least 3 carbon atoms, the other R can also be selected from methyl and ethyl; and further provided that, in Formula (II), the two RX groups taken together with the P atom to which they are attached can additionally form the residue of a heterocyclic nucleus having from 5 to 6 ring atoms; R_1 is hydrocarbyl; R_2 is selected from the class consisting of hydrocarbyl and hydrocarbyl substituted by at least one additional

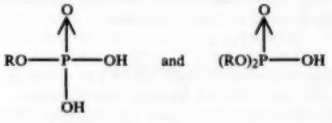


group wherein R has the significance defined above; n is an integer; and X in each instance is a chalcogen selected from oxygen and sulfur.

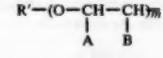
37. A storage stable composition comprising a mixture of:

(a) a polymethylene polyphenol polyisocyanate containing from about 25 to about 90 percent by weight of methylenebis(phenyl isocyanate) the remainder of said mixture being oligomeric polymethylene polyphenol polyisocyanates having a functionality higher than 2.0; and

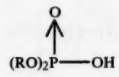
(b) from about 0.1 parts by weight to about 20 parts by weight, per 100 parts by weight of said polyisocyanate, of a pyrophosphate derived by removal of water of condensation from at least one acid phosphate selected from acid phosphates of the formulae:



wherein each R is independently selected from the class consisting of alkyl having at least 3 carbon atoms, alkeyl having at least 3 carbon atoms, aryl, aryl substituted by at least one alkyl, alkyl substituted by from 1 to 2 acyloxy groups wherein the acyl group is the residue of an aliphatic monocarboxylic acid having at least 2 carbon atoms, and



wherein R′ is selected from the class consisting of alkyl, aryl and aryl substituted by at least one alkyl, one of A and B represents hydrogen and the other is selected from the class consisting of hydrogen, methyl, chloromethyl and 2,2,2-trichloroethyl, and m is a number having an average value from 1 to 25, and mixtures of two or more of said acid phosphates; provided that, when one of the R groups in the formula



is alkyl having at least 3 carbon atoms, the other R can also be selected from methyl and ethyl, and further provided that the two RO groups in said formula, taken together with the P atom to which they are attached, can additionally form the residue of a heterocyclic nucleus having from 5 to 6 ring atoms.

4,257,996

PROCESS FOR PREPARING PARTICLE BOARD AND POLYISOCYANATE-PHOSPHORUS COMPOUND RELEASE AGENT COMPOSITION THEREFOR

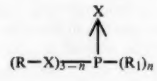
William J. Farrissey, Jr., Northford; Alexander McLaughlin, Meriden; Reinhard H. Richter, North Haven; Curtis P. Smith, Cheshire, and Benjamin W. Tucker, Bethany, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 14, 1980, Ser. No. 139,872

Int. Cl.[3] **B29J** *5/02;* **C08G** *18/28;* **C08L** *1/02*

U.S. Cl. 264—122 **22 Claims**

1. In a process for the preparation of particle board wherein particles of material capable of being compacted are contacted with a polyisocyanate composition and the treated particles are subsequently formed into boards by the application of heat and pressure, the improvement which comprises contacting said particles, in addition to the treatment with said polyisocyanate composition, with from about 0.1 to about 20 parts, per 100 parts by weight of said polyisocyanate, of a compound of the formula:



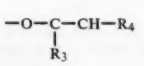
(I)

where R represents a member selected from the class consisting of alkyl having at least 3 carbon atoms, alkenyl having at least 3 carbon atoms, aryl, aryl substituted by at least one alkyl, lower-alkyl substituted by from 1 to 2 acyloxy groups wherein the acyl group is the residue of an aliphatic monocarboxylic acid having at least 2 carbon atoms, and

wherein

R_2 is selected from the class consisting of alkyl, aryl, and aryl substituted by at least one alkyl, one of A and B represents hydrogen and the other is selected from the class consisting of hydrogen, methyl, chloromethyl and 2,2,2-trichloroethyl, and m is a number having an average value from 1 to 25;

R_1 is a member selected from the class consisting of chlorine, bromine, lower-alkoxy, lower-alkylmercapto, arylamino, mono(lower-alkyl)amino, di(lower-alkyl)amino, hydroxy(lower-alkylene)oxy, aryloxy, hydrocarbylureido, and an enol residue of the formula



wherein

R_3 is hydrocarbyl, and R_4 is selected from the class consisting of hydrogen, hydrocarbyl, alkoxy and carbalkoxy, and R_3 and R_4 taken together represent the residue of a cycloalkenyl group;

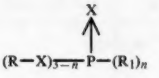
X is a chalcogen selected from the class consisting of oxygen and sulfur; and

n is an integer from 1 to 2; provided that, when n=1, one of the two R groups can also be selected from methyl and ethyl, and further provided that, when n=1, the two RX groups, taken together with the P atom to which they are attached, can additionally form the residue of a heterocyclic nucleus having from 5 to 6 ring atoms.

22. A composition adapted for use as a particle board binder comprising a mixture of

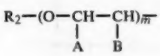
(a) a polymethylene polyphenyl polyisocyanate containing from about 25 to about 90 percent by weight of methylenebis(phenyl isocyanate) the remainder of said mixture being oligomeric polymethylene polyphenyl polyisocyanates having a functionality higher than 2.0; and

(b) from about 0.1 parts by weight to about 20 parts by weight, per 100 parts by weight of said polyisocyanate, of a compound of the formula:



(I)

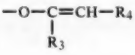
wherein R represents a member selected from the class consisting of alkyl having at least 3 carbon atoms, alkenyl having at least 3 carbon atoms, aryl, aryl substituted by at least one alkyl, lower-alkyl substituted by from 1 to 2 acyloxy groups wherein the acyl group is the residue of an aliphatic monocarboxylic acid having at least 2 carbon atoms, and



wherein

R_2 is selected from the class consisting of alkyl, aryl, and aryl substituted by at least one alkyl, one of A and B represents hydrogen and the other is selected from the class consisting of hydrogen, methyl, chloromethyl and 2,2,2-trichloroethyl, and m is a number having an average value from 1 to 25;

R_1 is a member selected from the class consisting of chlorine, bromine, lower-alkoxy, lower-alkylmercapto, arylamino, mono(lower-alkyl) amino, di(lower-alkyl) amino, hydroxy(lower-alkylene)oxy, aryloxy, hydrocarbylureido, and an enol residue of the formula:



(II)

wherein

R_3 is hydrocarbyl and R_4 is selected from the class consisting of hydrogen, hydrocarbyl, alkoxy and carbalkoxy, and R_3 and R_4 taken together represent the residue of a cycloalkenyl group;

X is a chalcogen selected from the class consisting of oxygen and sulfur; and

n is a integer from 1 to 2; provided that, when n=1, one of the two R groups can also be selected from methyl and ethyl, and further provided that, when n=1, the two RX groups, taken together with the P atom to which they are attached, can additionally form the residue of a heterocyclic nucleus having from 5 to 6 ring atoms.

4,257,997

SOLVENT STRETCH PROCESS FOR PREPARING A MICROPOROUS FILM

John W. Soehngen, Berkeley Heights, and Kenneth Ostrander, Summit, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,801
Int. Cl.[3] B28B *11/16*
U.S. Cl. 264—145 27 Claims

1. In a process for preparing an open-celled microporous film by (1) contacting a non-porous precursor film having both an amorphous component and a crystalline component with a swelling agent comprising a non-aqueous solvent having a Hildebrand solubility parameter at or near that of the precursor film, for a time sufficient to permit adsorption of the swelling agent into the film, (2) stretching said precursor film in at least one direction while in contact with the swelling agent, and (3) removing said swelling agent while maintaining said film in its stretched state the improvement which comprises:

(a) providing said precursor film from an olefin homopolymer or mixtures thereof characterized by a balance of properties of density, melt index, molecular weight distribution ratio (M_w/M_n), crystallization time, and a average gel count, sufficient to impart to the non-porous precursor film the potential to develop a Gurley value of less than about 2 seconds per mil of film thickness when stretched in a uniaxial direction in accordance with step (b);

(b) unaxially stretching the precursor film of (a) while in contact with the swelling agent under conditions of degree of stretch, strain rate, temperature, and precursor film thickness which are controlled in a manner sufficient to yield a uniaxially stretched microporous film having a Gurley value of less than 2.0 seconds per mil of film thickness; and

(c) transverse stretching the microporous film of (b) in a direction perpendicular to the uniaxial direction of stretch to increase the permeability of the microporous film of (b) without causing splitting of the resulting biaxially stretched microporous film.

4,257,998

METHOD OF MAKING A CELLULAR CORE WITH INTERNAL SEPTUM

James L. Diepenbrock, Jr., Wichita; M. Dean Nelsen, Goddard, and Marlyn F. Harp, Winfield, all of Kans., assignors to The Boenig Company, Seattle, Wash.

Division of Ser. No. 901,337, May 1, 1978. This application Sep. 11, 1978, Ser. No. 941,148
Int. Cl.[3] B29C *17/08*
U.S. Cl. 264—156 5 Claims

1. A method of making a cellular core panel with internal septum for installation in the high velocity air flow region of an engine nacelle, and other applications requiring sound absorption and increased air frame strength, the steps consisting of:

placing a destructible mold on a base,

said mold having upstanding studs in the top portion of the mold in a desired perforation pattern;

spreading a septum material on top of the mold to a desired septum thickness, the upstanding studs penetrating the layer of the septum material and extending therethrough;

positioning a cellular core above the septum material and pressing the core through the septum material and into the material of the destructible mold until the septum material is positioned at a precise position internally in the core; and

stabilizing the septum material until the septum material is self-supporting within each cell of the core and subsequently removing the mold thereby providing a permanent internal septum with a planar geometric configuration.

4,257,999

PROCESS FOR THE PRODUCTION OF HYDROPHILIC FILAMENTS AND FIBRES BY THE DRY JET WET-SPINNING METHOD

Ulrich Reinehr, Dormagen, and Frank Druschke, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 8, 1978, Ser. No. 931,955
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1977, 2736065
The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.
Int. Cl.[3] D01F *6/18*
U.S. Cl. 264—203 5 Claims

1. A process for the production of hydrophilic polyacrylonitrile filaments or fibres having a sheath/core structure, a porosity of at least 10% and a water-retention capacity of at least 10% and having fibre swelling factor which is lower than the water-retention capacity, wherein a solution of a filament forming synthetic polymer acrylonitrile is spun by the dry jet, wet spinning method, wherein, immediately on leaving the spinning jet and prior to coagulation in a precipitation bath, the filaments are contacted with superheated steam or with the vapour of another liquid which coagulates the filaments and wherein the resulting filaments are coagulated in a precipitation bath and subsequently drawn.

4,258,000

TOXIC-MONITORING BADGE AND METHOD OF USE

Arthur S. Obermayer, 139 Main St., Cambridge, Mass. 02142

Filed Aug. 2, 1979, Ser. No. 62,973
Int. Cl.[3] G01N *21/00*; C01G *28/00*
U.S. Cl. 422—55 18 Claims

1. A toxic-monitoring-badge material for the detecting and monitoring of toxic fluids in contact with the monitoring-badge material, which material comprises a solid, microporous, transparent, polymeric, matrix material having interconnecting micropores, the micropores being of sufficiently small size or of index-matching polymeric composition to permit the material to be transparent or be made transparent, when the micropores contain a liquid composition, and which micropores permit a high solute-liquid diffusion coefficient, and which matrix material includes, within the interconnecting small micropores, a liquid composition, which liquid composition is nonreactive with the polymeric matrix material and which is retained within the interconnecting pores of the matrix material in a volume greater than 20% by volume of the polymeric matrix material, and which liquid composition comprises:

(a) a nonevaporative solvent for the toxic fluid to be detected, whereby the fluid will be dissolved rapidly in the solvent, on exposure of the badge-monitoring material to the toxic fluid; and

(b) a reactant for the toxic fluid dissolved in the solvent which reacts with the toxic fluid, and which, on such reaction, results or causes a change in visual appearance of the liquid composition maintained within the micropores of the matrix material, whereby a rapid, diffusive change in the appearance of the transparent matrix material appears throughout the depth of the matrix material which signals and detects the presence of the toxic fluid to which the matrix material has been exposed.

4,258,001

ELEMENT, STRUCTURE AND METHOD FOR THE ANALYSIS OR TRANSPORT OF LIQUIDS

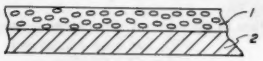
Zona R. Pierce, and David S. Frank, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1978, Ser. No. 973,669
Int. Cl.[3] G01N *31/22, 33/52, 33/54, 33/68*
U.S. Cl. 422—56 76 Claims

1. A particulate structure for the analysis or transport of a liquid comprising:

(i) a plurality of heat-stable, organo-polymeric particles non-swellable in and impermeable to said liquid, said particles having a particle size of from about 1 to 200 microns, and

(ii) an adhesive, in an amount less than 10 percent by weight of said particles, comprising an organic polymer different from that of said particles and insoluble in said liquid;



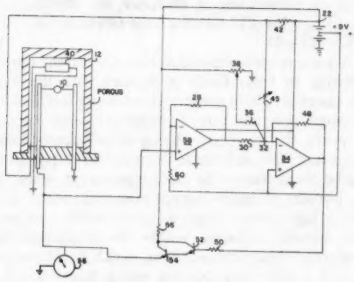
substantially all of said adhesive being concentrated on surface areas of adjacent particles where said adjacent particles are in closest proximity, and bonding said particles into a coherent, three-dimensional lattice which is non-swellable in said liquid and which has interconnected void spaces among said particles to provide transport of said liquid, said lattice having a void volume of from about 25 to 80 percent.

4,258,002

EXPLOSIVE GAS DETECTOR

Thomas A. Barr, 4618 Panorama Dr., Huntsville, Ala. 35801

Continuation of Ser. No. 890,372, Mar. 27, 1978, abandoned.
This application Jul. 16, 1979, Ser. No. 57,710
Int. Cl.[3] G01N *27/16, 31/12*
U.S. Cl. 422—95 **1 Claim**



1. An explosive gas detector comprising:

a container having a gas entrance;

a source of DC power having a ground reference terminal, a full voltage terminal, and a fractional voltage terminal;

impedance means positioned in said container and having first and second terminals, and comprising:

a conductor which varies in impedance directly with temperature,

a catalytic material coated on said conductor, which material increases in temperature in the presence of an explosive gas, and

said first terminal being connected to said reference terminal of said power source;

a transistor having its collector and emitter connected in series between said full voltage terminals of said power source and said second terminal of said impedance means;

first amplification means comprising an operational amplifier having its non-inverting input connected to said second terminal of said impedance means and its inverting input connected to said fractional voltage terminal of said power source;

a container temperature responsive circuit comprising a thermistor positioned within said container and a resistor connected in series with said thermistor between said reference terminal and one of said power terminals of said power source;

a summing circuit comprising:

a summing junction,

a first input to said summing junction comprising a resistor connected between the output of said first operational amplifier and said summing junction,

a second summing junction input comprising a container temperature responsive input including a variable resistor, one terminal of said variable resistor being connected to said summing junction, and the other terminal being connected through said resistor of said temperature responsive circuit to one of said power terminals of said power source, and

a third input to said summing junction comprising an operating level circuit, in turn including a second variable resistor connected between said junction and one of said power terminals of said power source;

a second operational amplifier, its inverting input being connected to said summing junction, and its non-inverting input being connected to said fractional voltage terminal of said power source;

drive means connected to the output of said second operational amplifier for applying a drive signal to the base of said transistor for controlling the impedance of said transistor as a direct function of current flow through said impedance means, whereby the voltage applied to said impedance means is decreased as a function of explosive gas sensed by said catalytic material; and

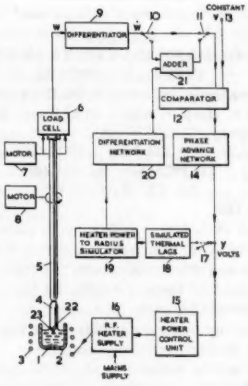
indication means responsive to the voltage across said impedance means for indicating the quantity of gas present.

4,258,003

AUTOMATIC CONTROL OF CRYSTAL GROWTH

Donald T. J. Hurle, and Gordon C. Joyce, both of Malvern, England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 562,670, Mar. 27, 1975, abandoned.
This application Dec. 1, 1976, Ser. No. 746,631
Claims priority, application United Kingdom, Apr. 3, 1974, 14885/74; Aug. 16, 1974, 36288/74
Int. Cl.[3] C30B *15/28*
U.S. Cl. 422—109 **7 Claims**



1. In an apparatus for growing crystals comprising:

a crucible for holding crystal material;

heaters operatively associated with said crucible to render said material molten;

a pull rod for pulling a single crystal from the molten material;

motors for rotating and raising the pull rod at rates related to the temperature of the molten material to produce a crystal having an expected radius;

a load cell for measuring the weight of said crystal, said cell producing an output which includes an error signal when

the radius of the crystal varies from the expected value, said error signal including a component which is a differential of radius variation with respect to time;

an electrical control loop connected between the load cell and said heaters, said loop including a comparator for comparing the output of said cell with voltage from a voltage source to produce a comparator output; and

a correction circuit connected to the control loop at a point between the load cell and said heaters, the improvement wherein said circuit comprises:

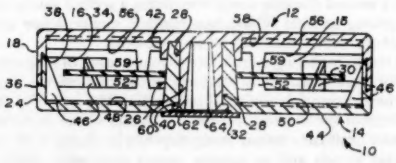
a differentiation network responsive to the load cell output for producing an output signal which includes a component which is a first differential with respect to time, and means joining said differentiation network output signal to said control loop for adding to the electrical control loop the output from the differentiation network to compensate for said differential of radius variation with time in the load cell output, to reduce said differential of radius variation with time and eliminate instability in said loop.

4,258,004

AIR FRESHENER

Joseph F. Valenzona, Harbor City, and Michael Fenstermaker, Lynwood, both of Calif., assignors to Orion Industries, Inc., Compton, Calif.

Filed Jul. 30, 1979, Ser. No. 62,060
Int. Cl.[3] A24F *25/00*; A61L *2/00*
U.S. Cl. 422—123 **1 Claim**



1. A portable air freshener comprising a housing with a cavity formed between first and second opposed relatively rotatable, separable concave trays,

said first tray having

a circular annular rim with spaced gaps therein defining channel-shaped windows, the outer edge extremity of said rim being formed into an annular beveled surface, and the inner edge extremity of said rim being formed into a corresponding beveled undercut ledge axially recessed from said outer edge extremity,

radially interiorally disposed axially extending separate positioning posts extending into said cavity,

a plurality of longitudinally separated, resiliently deflectable centrally located cantilevered arms extending axially beyond said rim and arranged in a circular configuration, each arm including a lip at its cantilevered extremity directed radially outwardly from said circular configuration,

said second tray comprising

a circular annular rim with an annular partition located radially inwardly therefrom and adjacent therebehind and extending axially beyond said circular rim to reside in sliding contact with the interior surface of said circular rim of said first tray, and spaced gaps are defined in said partition of said second tray to form channel-shaped windows, and the edges of said rim and said partition of said second tray are beveled to respectively reside in mating contact with said beveled surface of said outer edge extremity and said beveled undercut ledge of said circular rim of said first tray,

said second tray further comprising separate positioning posts located radially inwardly from said rim thereof in corresponding position relative to said positioning posts of said first tray,

a central annular axial sleeve projecting into said cavity axially beyond said partition and into the inwardly directed surface of the base of which a radial groove is defined, said inner diameter of said sleeve being just less than the span between the extremities of said lips of opposing ones of said arms when said arms are in an unbiased condition, and and said arms are deflectable inwardly to pass through said sleeve so that said lips may be moved into engagement with said radial groove in said base of said sleeve of said second tray,

a removably positioned absorbent pad disposed concentrically about said sleeve and impregnated with a scented liquid and held in said cavity between said opposed positioning posts of said first and second trays,

an external recess defined in said second tray at said base of said sleeve,

a cap removable inserted into said recess at said base of said sleeve and held by friction therein, and

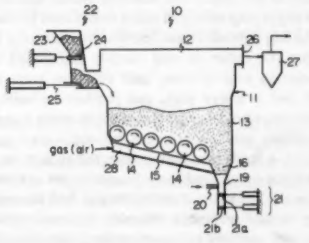
an adhesive member with an exposed pressure sensitive adhesive surface mounted on at least one of said trays at the axial center thereof.

4,258,005

THERMAL REACTOR WITH FLUIDIZING ROTORS

Kanichi Ito, Yokohama; Yoshio Hirayama, Zushi, and Yoshiki Kuroda, Fujisawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Oct. 31, 1979, Ser. No. 90,073
Claims priority, application Japan, Oct. 31, 1978, 53-134275
Int. Cl.[3] B01J *8/36, 8/38*; F23G *5/00*; F26B *21/00*
U.S. Cl. 422—143 **6 Claims**



1. A thermal reactor of a fluidized bed type comprising:

a vessel including a bottom plate provided with a discharge opening;

A plurality of hollow cylindrical rotors disposed in parallel above said bottom plate with a predetermined space between the adjacent rotors, each of the rotors being provided with a plurality of gas injecting perforations in the cylindrical wall thereof with the inside space of the rotor being coupled with a gas source, all the rotors being arranged to rotate in the same direction; and

a feeder for supplying materials into the vessel.

4,258,006

APPARATUS FOR FLUID CATALYTIC CONVERSION OF GASES

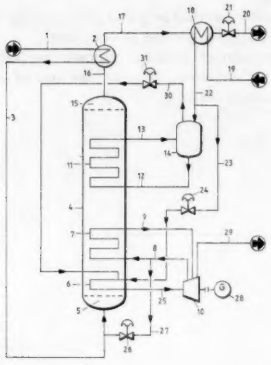
Claus Flockenhaus; Erich Hackler, and Werner Lommerzheim, all of Essen, Fed. Rep. of Germany, assignors to Thyssengas GmbH, Duisburg, and Didier Engineering GmbH, Essen, both of Fed. Rep. of Germany

Filed Jul. 23, 1979, Ser. No. 59,522

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1978, 2834589

Int. Cl.[3] B01J 8/24

U.S. Cl. 422—146 2 Claims



1. Apparatus for the catalytic conversion of feed gases into a product gas mixture containing a hydrocarbon gas under high pressure, said apparatus comprising an upwardly extending fluidized reactor, having an inlet at the lower end thereof and an outlet at the upper end thereof, means including a feed gas line for supplying said feed gases to the inlet to said reactor, means including a product gas line for withdrawing said product gas from the outlet of said reactor and means forming a reaction zone in said reactor, said reaction zone having an upper part and a lower part, and further including the improvement comprising a piping system forming a superheater, means mounting said superheater in said lower part of the reaction zone, a feedwater line connected to said superheater, a steam inlet line connected to said superheater, a steam turbine spaced from said reactor, a steam output line connecting said superheater to said turbine, a reheater, means connecting said reheater to said turbine, means mounting said reheater in said reaction zone above said superheater, a heat exchange coil, means mounting said heat exchange coil in said upper part of said reactor above said reheater, a steam drum spaced from said reactor, two pipes connecting said heat exchange coil to said steam drum, means connecting said steam drum to said feedwater line, means connecting said steam drum to said steam inlet line of said superheater, a line branching from said steam line leading from said turbine to said reheater, said branching line leading into said feed gas line, a heat exchanger, and means connecting both said product gas line and said feed gas line to said heat exchanger, whereby said feed gases are indirectly heated by said product gas.

4,258,007

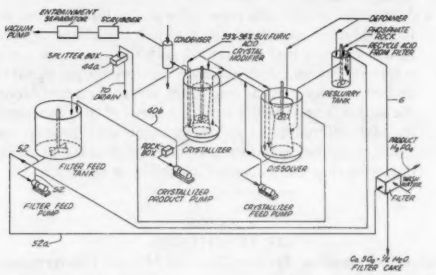
FEED SYSTEM FOR PHOSPHORIC ACID PRODUCTION WITH DECREASED FOAMING

F. Michael Gragg, Riverside, Calif., and Allen S. Adams, Jasper, Fla., assignors to Occidental Research Corporation and Occidental Chemical Company, both of Irvine, Calif.

Filed Jan. 5, 1978, Ser. No. 866,988

Int. Cl.[3] B01J 19/18; C01B 25/222

U.S. Cl. 422—189 8 Claims



1. A system for the preparation of phosphoric acid from phosphate rock and sulfuric acid, including in combination:

(a) a first reaction vessel containing a first slurry comprising calcium sulfate hemihydrate, monocalcium phosphate and phosphoric acid,

(b) a second reaction vessel containing a second slurry comprising calcium sulfate hemihydrate, monocalcium phosphate, sulfate ions and phosphoric acid,

(c) means including a draft tube means in each of said vessels for maintaining a continuous circulation of the slurry therein through said draft tube means at a rate of at least 50% of the volume of the slurry in said vessel per minute said draft tube means being disposed centrally in each of said vessels and an agitator means positioned axially in each of said vessels within said draft tube means, whereby on actuation of said agitator means the slurry in each of said vessels will flow from the bottom portion of said draft tube means up through the draft tube means and on exiting the top of the draft tube means, the slurry will flow downwardly in the space between said draft tube means and the inner wall of the vessel,

(d) a first conduit means interconnecting said first and second reaction vessels for conducting said first slurry from said first reaction vessel to said second reaction vessel,

(e) a second conduit means interconnecting said vessels for conducting said second slurry from said second reaction vessel to said first reaction vessel,

(f) means for providing a reduced pressure in said second reaction vessel to effect temperature control in said second reaction vessel by evaporation, means to circulate slurry between said second reaction vessel and said first reaction vessel at a sufficient rate so as to add desired sulfate values and phosphoric acid values to and to effect temperature control in said first reaction vessel, and means to form a vacuum seal between said first and second reaction vessels,

(g) an inlet pipe means for introducing a mixture of phosphate rock and phosphoric acid to said first reaction vessel,

(h) means for introducing sulfuric acid to said second reaction vessel,

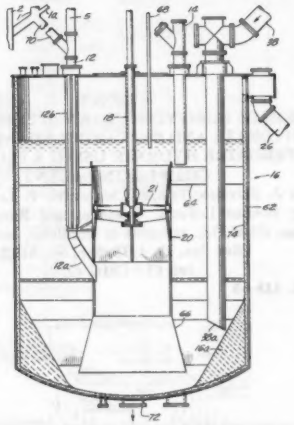
(i) means for withdrawing a slurry containing phosphoric acid and calcium sulfate hemihydrate from said second reaction vessel, and

(j) a vent means connected to said inlet pipe to permit escape of gases and, thus, increase the rate of flow of said mixture of phosphoric rock and phosphoric acid to said first reaction vessel.

4,258,008
SYSTEM FOR PHOSPHORIC ACID PRODUCTION WITH DECREASED FOAMING

Fredrick M. Gragg, Riverside; John D. Ellis, Upland, both of Calif., and Allen S. Adams, Jasper, Fla., assignors to Occidental Research Corporation and Occidental Chemical Company, both of Irvine, Calif.

Filed Jan. 5, 1978, Ser. No. 866,989
Int. Cl.³ B01J *19/18*; C01B *25/222*
U.S. Cl. 422—189 **10 Claims**



1. A system for the preparation of phosphoric acid from phosphate rock and sulfuric acid, including in combination:

(a) a first reaction vessel containing a first slurry comprising calcium sulfate hemihydrate, monocalcium phosphate and phosphoric acid,

(b) a second reaction vessel containing a second slurry comprising calcium sulfate hemihydrate, monocalcium phosphate, sulfuric acid and phosphoric acid,

(c) means including a draft tube means in each of said vessels for maintaining a continuous circulation of the slurry therein through said draft tube means at a rate of at least 50% of the volume of the slurry in said vessel per minute, said last mentioned means including a singlewall draft tube disposed centrally in each of said vessels and an agitator means positioned axially in each of said vessels within said draft tube, whereby on actuation of said agitator means the slurry in each of said vessels will flow from the bottom portion of said draft tube up through the draft tube and on exiting the top of the draft tube, the slurry will flow downwardly in the space between said draft tube and the inner wall of the vessel,

(d) a first conduit means interconnecting said first and second reaction vessels for conducting said first slurry from said first reaction vessel to said second reaction vessel,

(e) a second conduit means interconnecting said vessels for conducting said second slurry from said second reaction vessel to said first reaction vessel,

(f) means for providing reduced pressure to said second reaction vessel to effect temperature control in said second reaction vessel by evaporation, means to circulate slurry between said second reaction vessel and said first reaction vessel at a sufficient rate so as to add desired sulfate values and phosphoric acid values to and to effect temperature control in said first reaction vessel, and means to form a vacuum seal between said first and second reaction vessels,

(g) an inlet pipe means for introducing a mixture of phosphate rock and phosphoric acid to said first reaction vessel, said inlet pipe means having discharge means to the interior of the draft tube in said first vessel,

(h) means for introducing sulfuric acid to said second reaction vessel,

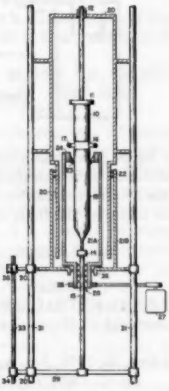
(i) means for withdrawing a slurry containing phosphoric acid and calcium sulfate hemihydrate from said second reaction vessel, and,

(j) a vent means connected to said inlet pipe means to permit escape of gases and reduce foaming generated by the dissolving reaction in said first vessel.

4,258,009
LARGE CRYSTAL FLOAT ZONE APPARATUS

Noel De Leon, Frederikssund; Arno I. M. Larsen, Holbaek; Poul E. Knudsen, Randboel, and Erik H. Jensen, Hundested, all of Denmark, assignors to Topsil A/S, Denmark

Filed May 8, 1978, Ser. No. 904,103
Claims priority, application Denmark, Aug. 22, 1977, 3719/77
Int. Cl.³ C30B *1/08*
U.S. Cl. 422—250 **6 Claims**



1. In an apparatus for the float zone refining of semiconductor materials which comprises a refining enclosure within which a rod of said semiconductor material is held and within which a molten zone traverses the length of said rod of semiconductor material and resolidifies forming a refined portion the improvement which comprises:

a telescoping lower portion of said enclosure, and

pins extensible from said lower portion and at an acute angle therewith for supporting the refined portion of said semiconductor rod.

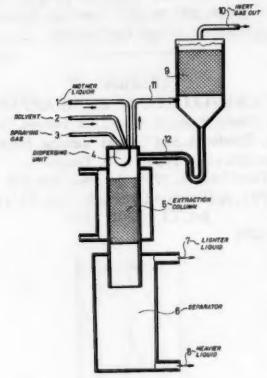
4,258,010
SOLVENT EXTRACTION APPARATUS

Laszlo Rozsa, Miskolc I; Lajos Meszaros, Szeged, and Ferenc Mogyorodi, Miskolc I, all of Hungary, assignors to Eszakmagyarorszagi Vegyimü vek, Sajobabony, Hungary

Continuation of Ser. No. 633,172, Nov. 19, 1975, abandoned, which is a division of Ser. No. 306,059, Nov. 13, 1972, Pat. No. 3,936,489. This application Nov. 7, 1977, Ser. No. 849,448
Int. Cl.³ B01D *11/04*
U.S. Cl. 422—257 **2 Claims**

1. An apparatus for solvent extraction of a mother liquor with a solvent immiscible with and having a different specific gravity than the mother liquor, comprising an extraction chamber; means for introducing the solvent, mother liquor, and a carrier gas into the chamber and, simultaneously atomizing the solvent and the mother liquor and dispersing same in the carrier gas to produce in said chamber a cloud phase, said means for introducing and atomizing being a spray nozzle, the introduction into the chamber of the atomized solvent and mother liquor dispersed in the carrier gas being through one and the same spray nozzle, neither the solvent nor the mother

liquor being atomized prior to said step of introducing and simultaneously atomizing means for separately conducting the solvent, the mother liquor and the carrier gas to the spray nozzle; condensation means arranged in said extraction chamber for terminating the cloud phase and producing a condensed extracted mother liquor phase and a condensed solvent phase containing the substance to be extracted; and means for separating the condensed extracted mother liquor phase from the condensed solvent phase on the basis of the different specific gravities of same.

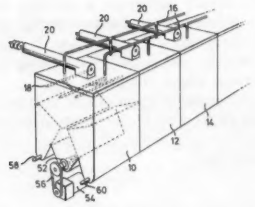


4,258,011

VEGETABLE OIL EXTRACTION APPARATUS

Bogdan D. E. Prazmowski, 45 Hayward Ct., Agincourt, Ontario, Canada

Filed Dec. 26, 1979, Ser. No. 106,518
Int. Cl.[3] B01D *11/02*
U.S. Cl. 422—273 **10 Claims**



1. Apparatus for solvent extraction of vegetable oil from vegetable solids having an extraction mode and a solids discharge mode, said apparatus comprising:

a vessel having an upper, vegetable solids holding zone, a lower, liquid receiving zone and a lower, extracted solids receiving zone;

means for supplying solvent to vegetable solids held in said holding zone;

foraminous support means pivotally mounted within said vessel, and pivotal between a first position in which the support means defines the lower boundary of said upper zone and supports vegetable solids held therein to cooperate in providing said extraction mode, and a second position in which the support means allows solids materials to pass from said upper zone to said lower solids receiving zone to cooperate in providing said solids discharge mode;

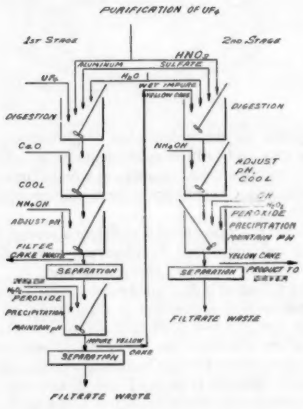
movable imperforate cover means located within said vessel, and coacting with said foraminous support means to pivot between a closed position covering and preventing access to said lower solids receiving zone to cooperate in providing said extraction mode, and to pivot to an open position providing access for solids materials from the upper vegetable solids holding zone to the lower solids receiving zone to cooperate in providing said solids discharge mode.

4,258,012

METHOD OF PURIFYING URANIUM TETRAFLUORIDE HYDRATE AND PREPARING URANIUM (VI) PEROXIDE HYDRATE USING A FLUORIDE COMPLEXING AGENT

Agustin J. Barreiro, Tampa; Charles M. T. Lowe, St. Petersburg; JoAnne LeFever, Brandon, and Ronald L. Pyman, Tampa, all of Fla., assignors to Gardinier, Inc., Tampa, Fla.

Filed Jun. 27, 1978, Ser. No. 919,558
Int. Cl.[3] C01G *43/01*
U.S. Cl. 423—8 **15 Claims**



1. A method of preparing uranium (VI) peroxide hydrate from uranium tetrafluoride hydrate, comprising the steps of:

(a) digesting uranium tetrafluoride hydrate in an aqueous acid solution in the presence of a fluoride complexing agent to produce an aqueous uranium solution,

(b) adjusting the aqueous uranium solution of step (a) to a pH between about 1 to about 3,

(c) filtering the aqueous uranium solution of step (b) to remove any undissolved material,

(d) reacting the aqueous uranium solution of step (c) with peroxide to precipitate uranium (VI) peroxide hydrate,

(e) separating the precipitated uranium (VI) peroxide hydrate of step (d),

(f) digesting the uranium (VI) peroxide hydrate of step (e) in an aqueous acid in the presence of a fluoride complexing agent to produce an aqueous uranium solution,

(g) adjusting the aqueous uranium solution of step (f) to a pH between about 1 to about 3,

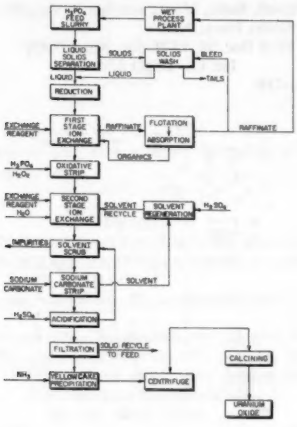
(h) reacting the aqueous uranium solution of step (g) with peroxide to precipitate uranium (VI) peroxide hydrate, and

(i) separating the precipitated uranium (VI) peroxide hydrate of step (h).

4,258,013
URANIUM RECOVERY FROM WET PROCESS PHOSPHORIC ACID

Roman Z. Pyrih; Robert S. Rickard, both of Golden, and Orin F. Carrington, Arvada, all of Colo., assignors to Earth Sciences Inc., Golden, Colo.

Filed Sep. 14, 1977, Ser. No. 833,247
Int. Cl.[2] C01G *43/02, 43/00*
U.S. Cl. 423—10 **28 Claims**



1. A process for the recovery of uranium from wet-process phosphoric acid derived from the acidification of uraniferous phosphate ores which comprises:

(a) reducing the uranium to the uranous form;

(b) contacting the reduced solution with a liquid-liquid solvent extraction agent which is a mixture of a mono- and di- (alkyl-phenyl) esters of orthophosphoric acid dissolved in an inert organic diluent, to effect transfer of the uranium into the organic phase;

(c) stripping the uranium from the organic phase of step (b) with a phosphoric acid solution containing a sufficient amount of an oxidizing agent to convert uranous uranium to uranyl uranium;

(d) contacting the diluted strip solution of step (c) with an organic phase containing as the liquid-liquid solvent extraction agent di(2-ethylhexyl) phosphoric acid and a synergistic agent dissolved in an inert organic diluent to effect transfer of the uranyl uranium into the organic phase;

(e) stripping the loaded agent of step (d) with an alkali metal carbonate solution;

(f) acidifying the strip solution of step (e) to precipitate iron, vanadium, and other impurities;

(g) adding ammonia to the purified acidic solution of step (f) to precipitate the uranium, and

(h) calcining the precipitated product of step (g) to a purified uranium oxide product.

4,258,014
PROCESS FOR RECOVERING URANIUM FROM WET PROCESS PHOSPHORIC ACID

Roman Z. Pyrih; Robert S. Rickard, both of Golden, and Orin F. Carrington, Arvada, all of Colo., assignors to Earth Sciences, Inc., Golden, Colo.

Filed Oct. 25, 1977, Ser. No. 845,351
Int. Cl.[2] C01G *43/00*
U.S. Cl. 423—10 **3 Claims**

1. The process for recovering uranyl uranium from an acid solution containing phosphate ions which comprises

(a) recovering the uranyl uranium from the solution by liquid-liquid solvent extraction with di(2-ethylhexyl)phosphoric acid to which has been added a synergistic concentration of a member selected from the group consisting of trioctylphosphine oxide, dibutyl butylphosphonate, and tributylphosphate;

(b) stripping the uranium from the uranium loaded extraction agent with sodium carbonate having a pH between about 8–10;

(c) neutralizing the uranium loaded strip solution to a pH of about 6.5 with sulfuric acid to precipitate iron, vanadium and other impurities;

(d) removing precipitated solids and other solids from the solution of (c); and

(e) recovering uranium as yellow cake from the solution of (d).

4,258,015
RECOVERING URANIUM FROM WET PROCESS PHOSPHORIC ACID WITH ALKYLPHENYL PHOSPHATES

Roman Z. Pyrih; Robert S. Rickard, both of Golden, and Orin F. Carrington, Arvada, all of Colo., assignors to Earth Sciences, Inc., Golden, Colo.

Filed Oct. 25, 1977, Ser. No. 845,352
Int. Cl.[2] C01G *43/00*
U.S. Cl. 423—10 **4 Claims**

1. In the process for the recovery of uranium from a phosphoric acid solution derived from the acidification of uraniferous phosphate ores including the steps of reducing the uranium in the phosphoric acid solution to the uranous form and contacting the resulting solution with a liquid-liquid solvent extraction agent which is a mixture of mono and di-(alkylpheny)esters of ortho phosphoric acid dissolved in an inert organic diluent, and wherein some of the extraction agent is lost in the raffinate, the improvement resulting in a continuous process with little addition of fresh extraction agent being required which comprises maintaining a preferred di- to monocomponent ratio in the extraction agent by continuously contacting the raffinate with beads of hydrophobic polystyrene polymer to absorb the components of the extraction agent on the beads, recovering the absorbed components from said beads and continuously returning the recovered di- and monocomponents to the extraction circuit at a rate to maintain the required ratio.

4,258,016
PROCESS FOR RECOVERING NI (II), CU (II) AND CO (II) FROM AN AMMONIACAL-AMMONIUM SULFATE LEACH LIQUOR

Richard E. Siemens, Albany; David Nilsen, Lebanon, and Stanley C. Rhoads, Corvallis, all of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 044,434, Jun. 1, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 125,408
Int. Cl.[3] C01G *3/00, 51/00*
U.S. Cl. 423—24 **6 Claims**

1. A process for recovery of nickel, copper and cobalt from an ammoniacal-ammonium sulfate leach liquor containing nickel(II), copper(II) and cobalt(III) comprising:

(1) adjusting the pH of said leach liquor to about 8.0 to 9.6 by stripping ammonia therefrom,

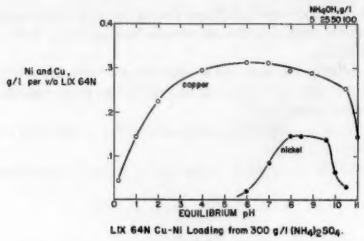
(2) co-extracting nickel and copper from the leach liquor by means of an extracting agent comprising about 46 to 50% of a β-hydroxybenzophenone oxime and about 1 to 2% of an aliphatic α-hydroxy oxime in a hydrocarbon diluent,

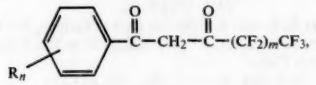
(3) washing the loaded extracting agent to remove sorbed ammonia, and recovering nickel and copper from the washed extracting agent,

(4) treating the raffinate from the co-extraction of step (2) to convert cobalt(III) to cobalt(II), and to adjust the pH of the raffinate to about 7.5 to 9.0,

(5) extracting cobalt(II) from said raffinate by means of an

extracting agent comprising a β-diketone chelating metal extractant of the formula





where n is 1 to 4, m is 0, 1 or 2 and R is an alkyl group of 1–25 carbon atoms, and

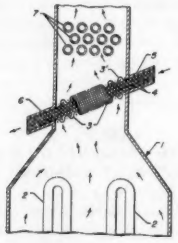
(6) washing the loaded extracting agent to remove sorbed ammonia, and recovering cobalt from the washed extracting agent.

4,258,017

VANADIUM REMOVAL FROM FURNACE GASES

Dennis B. Gelfand, Wheeling, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 26, 1979, Ser. No. 60,715
Int. Cl.[3] B01D *53/34*
U.S. Cl. 423—210 **6 Claims**



1. A method of reducing the vanadium concentration of flue gas derived from the combustion of a liquid residual oil containing vanadium compounds wherein said flue gas is passed through a radiant heating zone and convection heating zone of a furnace, which method comprises the steps of:

(a) removing said flue gas stream derived from said combustion of said liquid residual oil containing vanadium compounds from said radiant heating zone of said furnace;

(b) passing said flue gas stream removed from said radiant heating zone of said furnace through a passage duct wherein said flue gas stream is passed through a contacting zone comprising a multiplicity of high surface area contacting bodies extending across the cross-sectional area of said passage duct, wherein said contacting bodies comprise a refractory alumina-silica composite maintained at conditions effective to promote the transfer of said vanadium compounds in said flue gas stream to said contacting bodies;

(c) removing said flue gas stream from said passage duct possessing a diminished quantity of said vanadium compounds; and

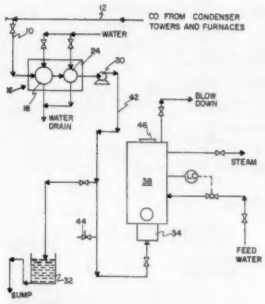
(d) passing said flue gas stream containing a diminished quantity of said vanadium compounds into said convection heating zone of said furnace.

4,258,018

PROCESSING ELEMENTAL PHOSPHORUS (P_4) CONTAINING GAS STREAMS

William J. Powell, Butte, Mont., assignor to Stauffer Chemical Company, Dobbs Ferry, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,479
Int. Cl.[3] B01D *53/34*
U.S. Cl. 423—210 **7 Claims**



1. A process for reducing the tendency of a carbon monoxide gas stream, containing a minor level of elemental phosphorus, to corrode metallic surfaces in a combustion zone upon combustion of the gas stream in the combustion zone, comprising:

(a) prior to combustion, cooling the gas stream to a sufficiently low temperature to condense a quantity of elemental phosphorus to produce a reduced level of elemental phosphorus in the gas stream; and

(b) injecting into the combustion zone during combustion an effective amount of MgO or a compound capable of yielding MgO to neutralize the quantity of acid produced by the combustion of the reduced level of elemental phosphorus.

4,258,019

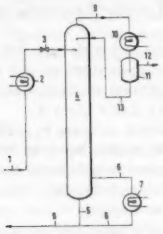
PROCESS OF REGENERATING ALKALI CARBONATE SOLUTIONS FORMED BY THE DESULFURIZATION OF HOT GASES

Heinz Hiller, Rembrücken; Johann Schlauer; Alexander Doerges, both of Frankfurt am Main; Georg Kempf, Schöneck; Vaclav Svoboda, Darmstadt, and Winfried Zeschmar, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,396
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743753
Int. Cl.[3] B01D *53/34*
U.S. Cl. 423—223 **12 Claims**

1. In a process for selective removal of H_2S from hot gases containing H_2S and CO_2, wherein the gases are contacted at superatmospheric pressure with an alkali metal carbonate solution and the resultant alkali metal carbonate solution which contains hydro-sulfides and bicarbonates is regenerated by pressure relieving the same, the so pressure relieved solution is thereafter stripped and re-used for selective removal of H_2S from hot gases containing the same and carbon dioxide, the improvement which comprises adjusting the alkali metal

bicarbonate content of the pressure-relieved solution to be stripped so that it is at least 55% of the total alkali content of



the solution and reusing said solution, following stripping, without cooling the same.

4,258,020

PROCESS FOR THE SIMULTANEOUS SEPARATION OF SULFUR AND NITROGEN OXIDES FROM A GASEOUS MIXTURE

Edward A. Ginger, Northbrook, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 894,963, Apr. 10, 1978, Pat. No. 4,192,855. This application May 16, 1979, Ser. No. 39,632

The portion of the term of this patent subsequent to Mar. 11, 1997, has been disclaimed.

Int. Cl.[3] B01D *53/34*

U.S. Cl. 423—239 **9 Claims**

1. In a process for the simultaneous separation of oxides of sulfur and nitrogen from a gaseous mixture containing said oxides and oxygen, wherein said mixture and ammonia are contacted with a solid sulfur oxides acceptor comprising copper, copper oxide, copper sulfate, or mixtures thereof dispersed on a carrier material, and wherein said solid acceptor is subjected to cyclic regeneration at an elevated temperature in contact with a reducing gas, the improvement which comprises compositing a rare earth metal, rare earth metal oxide or a mixture thereof with said solid acceptor, said rare earth, rare earth metal oxide or a mixture thereof, comprising an acceptance-regeneration promoter as well as a nitrogen oxides conversion catalyst.

4,258,021

METHOD OF PRODUCING UO_2 WHEREIN METHANOL WASH IS PROVIDED

Thomas Sondermann, Kahl, Fed. Rep. of Germany, assignor to Reaktor-Brennelement Union GmbH, Hanau, Fed. Rep. of Germany

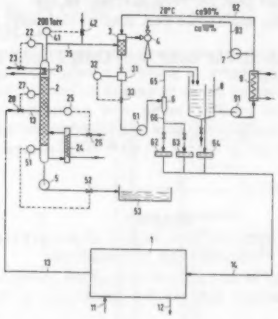
Filed May 24, 1978, Ser. No. 908,954

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1977, 2725534

Int. Cl.[3] C01G *1/02, 56/00*

U.S. Cl. 423—261 **5 Claims**

1. In the production of UO_2 in which ammonium uranyl carbonate is precipitated from an aqueous solution and separated as a contaminated wet product containing ammonium carbonate, the contaminated wet ammonium uranyl carbonate washed with methanol to remove contaminates and dehydrate the ammonium uranyl carbonate, and the purified ammonium uranyl carbonate converted to UO_2, the improvement comprising passing the methanol containing water and ammonium carbonate as impurities resulting from washing the contaminated ammonium uranyl carbonate to a rectification column, subjecting the impure methanol to fractional distillation in the column wherein the impure methanol is heated to vaporize it with the release of vapor from the top of the column and the discharge of liquid from the bottom of the column maintaining the column under subatmospheric pressure within the range of 175–225 Torr, cooling the top of the column to a low-temperature within the range of 30°–45° C. to condense a liquid water fraction in the vapor and retard decomposition of ammonium carbonate contained in the column top to prevent subsequent recombination of the decomposition products, and retain the bulk of the ammonium carbonate in solution in the liquid water fraction, releasing methanol vapor containing less than 5% water and a minor amount of ammonium carbonate from the top of the column, condensing the methanol vapor released



from the top of the column by direct intimate contact with a colder liquid methanol distillate, passing condensed methanol-containing crystals through a filter, to remove the crystals, and returning at least a portion of the methanol after separation of the crystals for washing contaminated wet ammonium uranyl carbonate, and discharging liquid water containing dissolved ammonium carbonate and less than 5% methanol from the bottom of the column.

4,258,022

CONTINUOUS PRODUCTION OF PHOSPHINE

Georg Elsner, Hürth-Knapsack; Werner Klose, Erftstadt; Christian May, Erftstadt, and Gero Heymer, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 12, 1979, Ser. No. 75,001

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840147

Int. Cl.[3] C01B *25/00*

U.S. Cl. 423—299 **2 Claims**

1. In the process for the continuous production of phosphane, wherein a mixture containing elemental yellow phosphorus, an aqueous alkali metal hydroxide solution and at least one alcohol with at least 5 carbon atoms as a reaction medium is reacted with agitation in a reaction zone, the resulting gaseous reaction products with the phosphane therein are collected, the reaction residue is separated into an aqueous phase and alcoholic phase, and the alcoholic phase is recycled to the reaction zone, the improvement which comprises: using the reactants in admixture with 0.01 to 2 weight %, based on the alcohol, of a surfactant selected from the group consisting of an addition product of ethylene oxide with an alcohol having 4 to 22 carbon atoms or with an alkyl phenol having 14 to 18 carbon atoms, the addition product containing 1 to 25 mols of ethylene oxide per mol of alcohol or alkyl phenol, a phosphoric acid monoester or phosphoric acid diester or a phosphoric acid monoester-diester mixture of an addition product of ethylene oxide with an alcohol having 4 to 22 carbon atoms or an alkyl phenol having 14 to 18 carbon atoms, the addition product containing 1 to 25 mols of ethylene oxide per mol of alcohol or alkyl phenol, an ether sulfate of an alkanol, alkylbenzene sulfonate, alkenylsulfonate or a sodium salt of these compounds containing 10 to 18 carbon atoms in the alkyl or alkenyl group, an ammonium salt containing at least one alkyl group having 12 to 18 carbons atoms.

4,258,023

PROCESS FOR THE PYROGENOUS PRODUCTION OF VERY FINELY DIVIDED OXIDES OF A METAL AND/OR OF A METALLOID

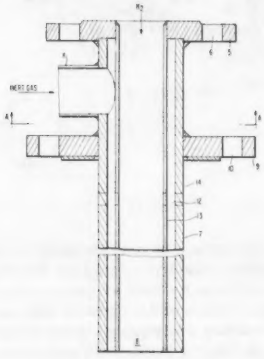
Josef Schmid, Rheinfelden; Ludwig Lange, Bruehl; Hans Klebe, and Dieter Schutte, both of Rheinfelden, all of Fed. Rep. of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 16, 1979, Ser. No. 85,358

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1978, 2849851

Int. Cl.[3] **C01B** *33/113;* **C01F** *7/02;* **C01G** *23/047, 17/02*

U.S. Cl. 423—336 **4 Claims**



1. In a process for the pyrogenic production of a finely dispersed oxide of a metal or a metalloid in a reaction apparatus wherein an evaporable halogen compound of the metal or metal oxide is used as the starting material and wherein elementary halogen is formed as a by-product during the conversion of said evaporable halogen compound to said oxide, and further wherein said halogen by product is converted into hydrogen halide during the cooling down of the reaction products by feeding gaseous hydrogen into the cooling section of said apparatus by means of a pipe entering into the cooling section of said apparatus, the improvement comprising introducing the gaseous hydrogen into the cooling section of the apparatus by means of the inner pipe of at least one double-jacket pipe, which is inserted into the cooling section whereby simultaneously an inert gas is introduced into said cooling section by means of the same double-jacket pipe, which inert gas is guided between the outside and the inside jacket of the double jacket pipe.

4,258,024

NON-POLLUTANT PROCESS FOR THE MANUFACTURE OF NEUTRAL CALCIUM HYPOCHLORITE WITH A HIGH CONTENT OF ACTIVE CHLORINE

Jean O. Hoffer, Thann; Jean C. Guelen, Fellering; Pierre J. Portes, Thann, and Jean P. Haller, Kruth, all of France, assignors to Potasse et Produits Chimiques, Thann, France

Continuation-in-part of Ser. No. 858,355, Dec. 7, 1977, abandoned, which is a continuation of Ser. No. 770,845, Feb. 22, 1977, abandoned, which is a continuation of Ser. No. 668,670, Mar. 19, 1976, abandoned. This application Feb. 26, 1980, Ser. No. 124,854

Claims priority, application France, Mar. 27, 1975, 75 10687; Sep. 19, 1975, 75 294611

Int. Cl.[3] **C01B** *11/06*

U.S. Cl. 423—474 **7 Claims**

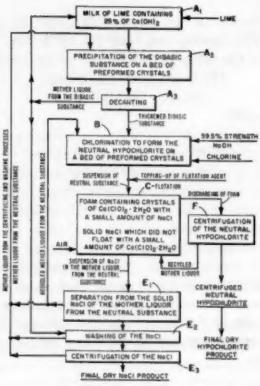
1. Process for the manufacture of neutral calcium hypochlorite with high active chlorine content comprising the following steps:

a. a milk of lime is prepared by adding calcium hydroxide to a part of the recycled mother liquor originating from step (c);

b. the milk of lime is reacted with recycled mother liquor originating from step (g) or steps (g) and (h) or steps (f) and (h) to form a suspension of dibasic calcium hypochlorite;

c. the suspension of dibasic calcium hypochlorite is separated from a part of its mother liquor to form a thickened slurry of dibasic calcium hypochlorite and a mother liquor, part of which is recycled to step (a) and another part of which is recycled to step (h);

d. the thickened slurry of dibasic calcium hypochlorite and separately introduced sodium hydroxide are chlorinated together with gaseous chlorine in the presence of a suspension of preformed crystals of neutral calcium hypochlorite and crystals of sodium chloride and capable of acting as a seed bed for the production in the slurry of further separable and recoverable amounts of the desired neutral calcium hypochlorite product, this suspension receiving recycled mother liquor originating from step (f)


MILK OF LIME CONTAINING
LIME
PRECIPITATION OF THE DIBASIC SUBSTANCE ON A BED OF PREFORMED CRYSTALS
DECANTING
CHLORINATION TO FORM THE NEUTRAL HYPOCHLORITE ON A BED OF PREFORMED CRYSTALS
CHLORINE
FOAM CONTAINING CRYSTALS OF
SOLID NaCl WHICH DID NOT FLOAT WITH A SMALL AMOUNT OF
CENTRIFUGATION OF THE NEUTRAL HYPOCHLORITE
AIR
RECYCLED MOTHER LIQUOR
CENTRIFUGED NEUTRAL HYPOCHLORITE
SEPARATION FROM THE SOLID NaCl OF THE MOTHER LIQUOR FROM THE NEUTRAL SUBSTANCE
WASHING OF THE NaCl
FINAL DRY HYPOCHLORITE PRODUCT
CENTRIFUGATION OF THE NaCl
FINAL DRY NaCl PRODUCT

or step (g) or steps (f) and (g) or steps (g) and (h) whereby crystals of neutral calcium hypochlorite and crystals of sodium chloride are in suspension in a mother liquor;

e. the suspension of crystals produced in step (d) is formed into an upper suspension which is rich in crystals of neutral calcium hypochlorite and a lower suspension which is rich in crystals of sodium chloride and the lower and upper suspension separated from one another;

f. the crystals of neutral calcium hypochlorite are separated from the suspension rich in calcium hypochlorite to leave a mother liquor which is recycled to step (e) or steps (b), (d) and (e) or steps (b) and (d);

g. optionally the crystals of sodium chloride are separated from the suspension rich in sodium chloride, in which case the resulting mother liquor is recycled to step (d) or steps (b) and (d); and

h. the sodium chloride crystals from step (g) when used, or the lower suspension issuing from step (e) when step (g) is not used, is treated with at least a part of the mother liquor arising from step (c) and the crystals of sodium chloride separated from their mother liquor which is recycled entirely to step (b) or entirely to step (d),

all the steps being carried out at a temperature not exceeding 20° C.

4,258,025

PD/SiO_2 HYDROGENATION CATALYST SUITABLE FOR H_2O_2 MANUFACTURE

Harry B. Copelin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 15,208, Feb. 26, 1979, which is a continuation-in-part of Ser. No. 948,036, Oct. 2, 1978, abandoned. This application Nov. 2, 1979, Ser. No. 90,676

Int. Cl.[3] C01B *15/02*

U.S. Cl. 423—588 5 Claims

1. In a process for producing hydrogen peroxide by alternately hydrogenating an alkylanthraquinone and/or a tetrahydroalkylanthraquione and oxygenating the resulting alkylanthrahydroquinone and/or tetrahydroalkylanthrahydroquinone to regenerate the alkylanthraquinone and/or tetrahydroalkylanthraquinone and to produce hydrogen peroxide, the improvement comprising conducting the hydrogenation in the presence of a catalyst consisting essentially of an amorphous silica support having deposited thereon about 0.05–5 percent by weight based on the weight of silica of at least one oxide, hydroxide or carbonate of at least one metal selected from the group consisting of zirconium, thoriium, hafnium, cerium, and titanium and about 0.1–10 percent by weight based on the weight of silica of palladium metal; the metal oxide, hydroxide or carbonate being deposited before or simultaneously with the palladium metal in the form of its oxide, hydroxide or carbonate.

4,258,026

HYDROGEN IODIDE DECOMPOSITION

Dennis R. O'Keefe, San Diego, and David G. Williamson, San Luis Obispo, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Mar. 26, 1979, Ser. No. 23,887

Int. Cl.[3] C01B *1/03*

U.S. Cl. 423—648 R 10 Claims

1. A process for the decomposition of hydrogen iodide which comprises

maintaining contact between a platinum group metal catalyst and hydrogen iodide for a time sufficient to decompose a substantial portion of said hydrogen iodide to hydrogen and iodine, and

recovering gaseous H_2 which results therefrom,

wherein the improvement comprises controlling the temperature and the pressure to maintain said hydrogen iodide in liquid form whereby greater conversion is obtained that is obtained for gaseous decomposition.

4,258,027

MULTI-FRACTIONABLE TABLET STRUCTURE

Michael K. Ullman; Stephen T. David, and Claude E. Gallian, all of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 24,139, Mar. 26, 1979, Pat. No. 4,215,104. This application Feb. 14, 1980, Ser. No. 121,615

Int. Cl.[3] A61K *9/44*

U.S. Cl. 424—15 17 Claims

1. A tablet structure which comprises a unitary body having oppositely disposed first and second substantially horizontal surfaces being joined respectively by substantially vertical walls; any one of said first horizontal surface, or said second horizontal surface, or said substantially vertical walls containing at least two transverse score markings and at least one other of said surfaces or walls containing a single transverse score marking whereby the unitary body may be fractured into at least equal bisectional or equal trisectional units for consumption.

4,258,028

METHOD FOR REDUCING DENTAL PLAQUE AND PELLICLE PRECURSOR OF PLAQUE

Taylor C. Miller, Jr., Montgomery, Ala., assignor to Cameo, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 904,335, May 9, 1978, Pat. No. 4,178,363. This application Aug. 27, 1979, Ser. No. 70,044

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.[3] A61K *7/16, 7/24, 31/315, 31/20*

U.S. Cl. 424—49 15 Claims

1. A method for reducing dental plaque and pellicle precursor of plaque comprising brushing or irrigating the teeth with a dental preparation containing an active ingredient, the active ingredient comprising from about 0.6% by weight to about 20% of zinc undecylenate and from 0% to about 2% by weight of undecylenic acid based on the weight of the dental preparation.

4,258,029

SYNTHETIC ADJUVANTS FOR STIMULATION OF ANTIGENIC RESPONSES

Peter J. Moloney, and George Wojcik, both of Toronto, Canada, assignors to Connaught Laboratories Limited, Willowdale, Canada

Filed Apr. 23, 1979, Ser. No. 32,570

Int. Cl.[3] A61K *39/02, 39/08, 39/12, 39/13*

U.S. Cl. 424—88 7 Claims

1. In a composition comprising at least one bacterial or viral antigenic species and at least one adjuvant in an amount effective to enhance the antigenic response of said antigenic species, the improvement wherein said adjuvant is an ester of a long chain alcohol containing 12 to 22 carbon atoms in the alkyl group and an amino acid.

4,258,030

UROKINASE PREPARATION FOR ORAL ADMINISTRATION

Koji Sasaki, Omiya, and Yasukazu Harada, Tokyo, both of Japan, assignors to Zeria-Shinyaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1979, Ser. No. 18,240

Int. Cl.[3] A01N *63/02;* A61K *37/00;* C07C *103/52;* C12N *9/99*

U.S. Cl. 424—94 11 Claims

1. A pharmaceutical composition with anithrombotic action for oral administration comprising an effective amount of urokinase and an effective urokinase stabilizing amount of an enzyme inhibitor which is a trypsin inhibitor extractable from human urine selected from the group consisting of mingin, minginin and urine trypsin inhibitor, together with a pharmaceutical carrier.

4,258,031

FEED COMPOSITION CONTAINING RONNEL AND ANTIBIOTIC A3823 COMPLEX AND USE THEREOF

James T. Tollett, and Donald R. Fletcher, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 928,120, Jul. 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 774,299, Mar. 4, 1977, abandoned. This application Sep. 21, 1979, Ser. No. 77,697

Int. Cl.[3] A61K *35/00*

U.S. Cl. 424—115 20 Claims

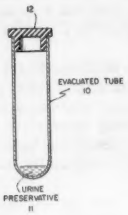
1. The method of promoting nutritional responses of an animal selected from the group consisting of feeder cattle and poultry which comprises: introducing into the diet of an animal of the designated class in combination about 1 mg of monensin and about 2 mg of a phosphate ester per kilogram of body weight per day substantially over a period of at least about 28 days in the case of feeder cattle and at least 3 days in the case of poultry, said phosphate ester being selected from the group consisting of ronnel, bromophos and iodofenphos.

4,258,032

PRESERVATION OF URINE SPECIMENS

Jack J. Mehl, Landing, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Jan. 15, 1979, Ser. No. 3,237
Int. Cl.[3] **A01N** *37/00, 59/14*
U.S. Cl. 424—148 **15 Claims**



1. A bacteriostatic liquid preservative for urine, comprising: boric acid, alkali formate and a liquid selected from the group consisting of water and glycerine in amounts effective to provide a liquid preservative for a urine sample, said boric acid and alkali formate being dissolved in the liquid to provide from 0.9 to 1.2% of boric acid and from 0.5 to 0.6% of alkali formate in a urine sample.

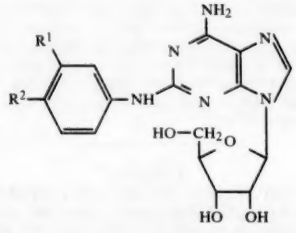
4,258,033

2,6-DIAMINONEBULARINES

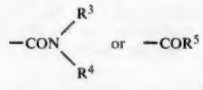
Ryuji Marumoto, Minoo; Masao Tanabe, Osaka, and Yoshiyasu Furukawa, Shinsenriminami, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 12, 1979, Ser. No. 85,057
Claims priority, application Japan, Oct. 16, 1978, 53-127109; Jul. 9, 1979, 54-87074
Int. Cl.[3] **A61K** *31/70;* **C07H** *17/00, 19/16*
U.S. Cl. 424—180 **11 Claims**

1. A compound of the formula:

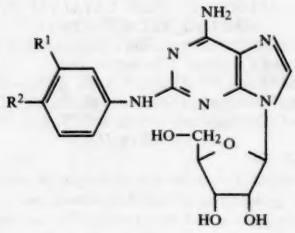


wherein one of R^1 and R^2 is of the formula:

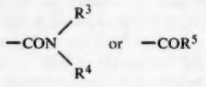


and the other is hydrogen, halogen or lower alkoxyl in the above formulas, R^3 is hydrogen or lower alkyl; R^4 is hydrogen, lower alkyl, cyclohexyl or phenyl and R^5 is lower alkyl or an acid addition salt thereof.

10. A pharmaceutical composition which contains an effective amount for the treatment of ischemis heart diseases in mammals of a compound of the formula:

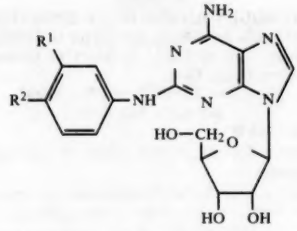


wherein one of R^1 and R^2 is of the formula:

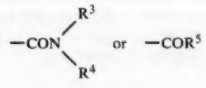


and the other is hydrogen, halogen or lower alkoxyl in the above formulas, R^3 is hydrogen or lower alkyl; R^4 is hydrogen, lower alkyl, cyclohexyl or phenyl and R^5 is lower alkyl or an acid addition salt thereof, and a pharmaceutically acceptable carrier, vehicle or diluent therefor.

11. A method for the treatment of ischemic heart diseases in mammal, which comprises administering to the mammal an effective amount of a compound of the formula:



wherein one of R^1 and R^2 is of the formula:



and the other is hydrogen, halogen or lower alkoxyl in the above formulas, R^3 is hydrogen or lower alkyl; R^4 is hydrogen, lower alkyl, cyclohexyl or phenyl and R^5 is lower alkyl, or an acid addition salt thereof.

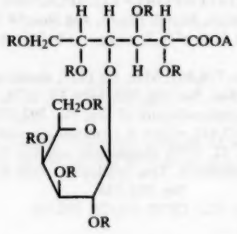
4,258,034

LACTOBIONIC ACID POLY(H-SULFATE) AND SALTS THEREOF USEFUL AS COMPLEMENT INHIBITORS

Joseph P. Joseph, Cliffside Park, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

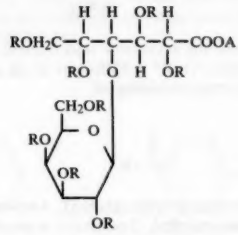
Filed Nov. 5, 1979, Ser. No. 91,214
Int. Cl.[3] **A61K** *31/70;* **C07H** *11/00*
U.S. Cl. 424—180 **14 Claims**

1. A compound of the formula:



wherein R is —SO_3A; and A is a pharmaceutically acceptable salt cation.

8. A method of inhibiting the complement system in a warm-blooded animal which comprises administering to said animal an effective complement inhibiting amount of a compound of the formula:



wherein R is —SO_3A; and A is a pharmaceutically acceptable salt cation.

4,258,035

METHOD AND COMPOUND FOR TREATMENT OF ARTHRITIC CONDITIONS IN DOGS

Janice A. Spies, 335 Brookside Cir., Wheaton, Ill. 60187

Filed Nov. 27, 1978, Ser. No. 964,332
Int. Cl.³ A61K *35/78*
U.S. Cl. 424—195 **4 Claims**

1. The method of reducing calcification of the spine as an arthritic condition in dogs, said method comprising feeding a dog having said condition a powdered mixture of herbal components consisting essentially of:

(a) Comfrey as *Symphytum officinale;*
(b) Mullein as *Verbascum thapsus;*
(c) Fenugreek as *Trigonella foenumgraecum;*
(d) Nettle as *Urtica dioica;*
(e) Broom tops as *Cytisus scoparius;* and
(f) Boneset as *Eupatorium perfoliatum,*

the powders being made from the root of said Comfrey plant, the leaf of said Mullein plant, the seed of said Fenugreek plant and the pulverized dried plans of said Nettle, Broom tops and Boneset, said powders being combined in the proportions of about 1.8 parts of (a), 0.6 parts of (b); 0.3 parts each of (c), (d) and (f); and 0.25 parts of (e).

4,258,036

COLOR AND GROWTH ENCHANCEMENT OF THE COAST OF FELINES AND CANINES

Phyllis T. Greer, 275 Channel Dr., Novato, Calif. 94947

Filed Aug. 27, 1979, Ser. No. 69,933
Int. Cl.³ A61K *35/78, 47/00*
U.S. Cl. 424—195 **2 Claims**

1. A method of enhancing the color and growth of the coat on mammals selected from the group consisting of felines and canines comprising orally administering one-fourth to one teaspoon per day per ten pounds of body weight of a formulation having at least 50% capsicum tetragonum as a component thereof and the remainder being a mixture of kelp and a gelatinous material.

4,258,037

THERAPEUTIC COMPOUNDS FOR THE TREATMENT OF URO-GENITAL DISORDERS

Pierre Juvin, Neuilly-sur-Seine, France, assignor to Sertog Societe d'Etudes de Recherches de Travoux d'Organisation et de Gestion, France

Continuation of Ser. No. 852,088, Nov. 16, 1977, abandoned. This application Nov. 14, 1979, Ser. No. 94,152
Claims priority, application France, Dec. 2, 1976, 76 36295
Int. Cl.³ A61K *35/78*
U.S. Cl. 424—195 **11 Claims**

1. A method for the treatment of female patients suffering from bartholinitis, comprising:

administering orally, parenterally or rectally to the patient an amount effective for the treatment of bartholinitis of a mixture of

an extract of at least one plant of the Rosaceae family selected from the group consisting of *Prunus Wallitchi, Prunus Javanica, Prunus Arborea, Prunus Lusitanica, Prunus Africana* (or *Pygmeum Africanum*) and mixtures thereof, said extract being obtained by first extracting the plant with a lipid, treating the resultant lipidic material with an alkali which reacts with the fatty acids present in the lipidic material, and then subjecting the unreacted lipidic material to solvent extraction to obtain the therapeutic extract, and

a mono-aminated amino acid selected from the group consisting of glycine, L-glutamic acid, L-alanine and mixtures thereof,

wherein the weight ratio of extract to amino acid is from 1:6 to 1:25.

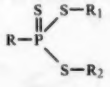
4,258,038

UNSYMMETRICAL THIOPHOSPHONATE INSECTICIDES AND NEMATOCIDES

Jerry G. Strong, Midlothian, Va., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 31, 1979, Ser. No. 71,464
Int. Cl.³ A01N *57/12;* C07F *9/40*
U.S. Cl. 424—222 **36 Claims**

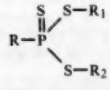
1. A method for controlling insects and nematodes which comprises applying thereto a pesticidal amount of a compound of the formula



in which

R is an alkyl of 1 to 6 carbon atoms;
R_1 is an alkyl of 1 to 6 carbon atoms;
R_2 is a branched alkyl of 3 to 8 carbon atoms; and
R_1 and R_2 are different.

12. A composition comprising as the active ingredient a compound of the formula

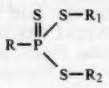


in which

R is an alkyl of 1 to 6 carbon atoms;
R_1 is an alkyl of 1 to 6 carbon atoms;
R_2 is a branched alkyl of 3 to 8 carbon atoms; and

R_1 and R_2 are different; in an amount effective as an insecticide or nematocide; and an inert, non-phytotoxic organic solvent or a solid carrier.

24. A compound of the formula



in which

R is an alkyl of 1 to 6 carbon atoms;

R_1 is an alkyl of 1 to 6 carbon atoms;

R_2 is a branched alkyl of 3 to 8 carbon atoms; and

R_1 and R_2 are different.

4,258,039

NOVEL 7-ALKYL-STEROIDS

Lucien Nedelec, Le Raincy; Vesperto Torelli, Maisons-Alfort; Robert Fournex, Paris, and Colette Tournemine, Livry-Gargan, all of France, assignors to Roussel Uclaf, Paris, France

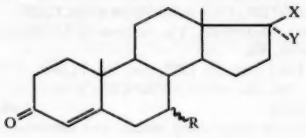
Filed Feb. 29, 1980, Ser. No. 125,891

Claims priority, application France, Mar. 22, 1979, 79 07273

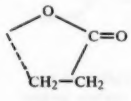
Int. Cl.[3] **A61K** *31/58;* **C07J** *9/00*

U.S. Cl. 424—241 **34 Claims**

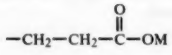
1. 7-alkyl-Δ^4-17α-pregnene-3-ones of the formula



wherein R is selected from the group consisting of saturated and unsaturated alkyl of 2 to 8 carbon atoms, cycloalkyl alkyl of 4 to 8 carbon atoms and arylalkyl of 7 to 12 carbon atoms and X and Y form the group



or X is OH and Y is



and M is selected from the group consisting of hydrogen, alkali metal and NH_4 and the wavy line indicates the α- or β-position or mixtures thereof.

27. A method of treating arterial hypertension and cardiac insufficiencies in warm-blooded animals comprising administering to warm-blooded animals an amount of at least one compound of claim **1** sufficient to relieve cardiac insufficiencies and arterial hypertension.

4,258,040

CEPHALOSPORIN COMPOUNDS

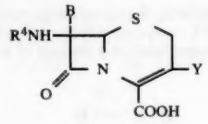
Burton G. Christensen, Scotch Plains, and Ronald W. Ratcliffe, North Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 776,401, Mar. 10, 1977, abandoned, which is a continuation of Ser. No. 576,403, May 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 392,159, Aug. 27, 1973, Pat. No. 3,947,413, which is a continuation-in-part of Ser. No. 314,485, Dec. 12, 1972, abandoned, and Ser. No. 306,064, Nov. 13, 1972, abandoned. This application May 4, 1978, Ser. No. 902,586

Int. Cl.[3] **C07D** *501/20, 501/36*

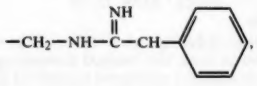
U.S. Cl. 424—246 **9 Claims**

1. A compound having the structural formula:

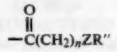


and the pharmaceutically acceptable salts thereof; wherein: B is hydrogen or methoxyl; R^4 is hydrogen or an acyl radical selected from the group consisting of:

wherein: R" is benzyl, p-hydroxybenzyl, 4-amino-4-carboxybutyl, methyl, cyanomethyl, 2-pentenyl, n-amyl, n-heptyl, ethyl, 3- or 4-nitrobenzyl, phenethyl, β,β-diphenylethyl, methyldiphenylmethyl, triphenylmethyl, 2-methoxyphenyl, 2,6-dimethoxyphenyl, 2,4,6-trimethoxyphenyl, 3,5-dimethyl-4-isoxazolyl, 3-butyl-5-methyl-4-isoxazolyl, 5-methyl-3-phenyl-4-isoxazolyl, 3-(2-chlorophenyl)-5-methyl-4-isoxazolyl, 3-(2,6-dichlorophenyl)-5-methyl-4-isoxazolyl, D-4-amino-4-carboxybutyl, D-4-N-benzoylamino-4-carboxy-n-butyl, p-aminobenzyl,

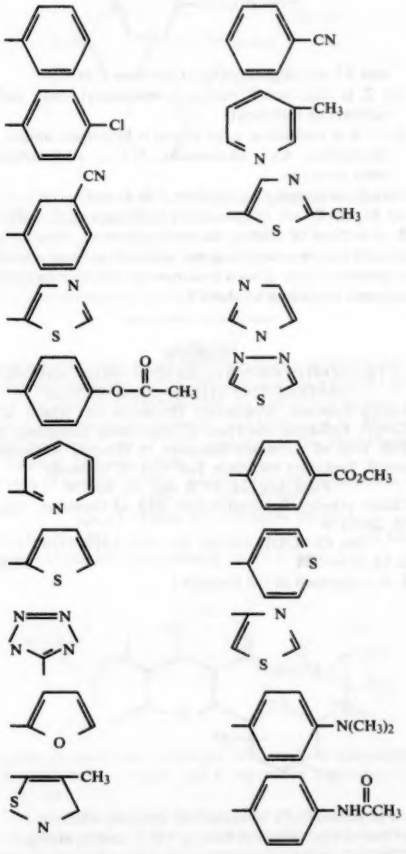


o-aminobenzyl, m-aminobenzyl, (3-pyridyl)methyl, 2-ethoxy-1-napthyl, 3-carboxy-2-quinoxalinyl, 3-(2,6-dichlorophenyl)-5-(2-furyl)-4-isoxazolyl, 3-phenyl-4-isoxazolyl, 5-methyl-3-(4-guanidinophenyl)-4-isoxazolyl, 4-guanidinobenzyl, 4-guanidinophenyl, 2,6-dimethoxy-4-guanidinophenyl, o-sulfobenzyl, p-carboxymethylbenzyl, p-carbamoylmethylbenzyl, m-fluorobenzyl, m-bromobenzyl, p-chlorobenzyl, p-methoxybenzyl, 1-naphthylmethyl, 3-isothiazolylmethyl, 4-isothiazolylmethyl, 5-isothiazolylmethyl, 4-pyridylmethyl, 5-isoxazolylmethyl, 4-methoxy-5-isoxazolylmethyl, 4-methyl-5-isoxazolylmethyl, 1-imidazolylmethyl, 2-benzofuranylmethyl, 2-indolylmethyl, 2-phenylvinyl, 2-phenylethynyl, 2-(5-nitrofuranyl)vinyl, phenyl, o-methoxyphenyl, o-chlorophenyl, o-phenylphenyl, p-aminomethylbenzyl, 1-(5-cyanotriazolyl)methyl, difluoromethyl, dichloromethyl, dibromomethyl, 1-(3-methylimidazolyl)methyl, 2- or 3-(5-carboxymethylthienyl)methyl, 2- or 3-(4-carbamoylthienyl)methyl, 2- or 3-(5-methylthienyl)methyl, 2- or 3-(5-methoxythienyl)methyl, 2- or 3-(4-chlorothienyl)methyl, 2- or 3-(5-sulfothienyl)methyl, 2- or 3-(5-carboxythienyl)methyl, 3-(1,2,5-thiadiazolyl)methyl, 3-(4-methoxy-1,2,5-thiadiazolyl)methyl, 2-furylmethyl, 2-(5-nitrofuryl)methyl, 3-furylmethyl, 2-thienylmethyl, 3-thienylmethyl, or tetrazolylmethyl; or the radical R^4 is represented by:



wherein n is 0–4, Z represents oxygen or sulfur, and R″ is defined above; or the radical R^4 is represented by:

wherein R″ is defined as above and R‴ is a radical selected from the group consisting of: amino, hydroxy, azido, carbamoyl, guanidino, halo, sulfamino, tetrazolyl, sulfo, and carboxyl; and Y is selected from:



4,258,041

(6R,7R)-7-[(Z)-2-(2-AMINOTHIAZOL-4-YL)-2-(2-CARBOXYPROP-2-OXYIMINO)ACETAMIDO]-3-(1-PYRIDINIUMMETHYL)-CEPH-3-EM-4-CARBOXYLATE AND SALTS THEREOF

Cynthia H. O'Callaghan, Gerrards Cross; David G. H. Livermore, and Christopher E. Newall, both of London, all of England, assignors to Glaxo Group Limited, London, England

Filed May 25, 1979, Ser. No. 42,594

Claims priority, application United Kingdom, May 26, 1978, 22911/78; May 26, 1978, 22913/78

Int. Cl.[3] **C07D** *499/44*

U.S. Cl. 424—246 **6 Claims**

1. A cephalosporin antibiotic compound which is (6R,7R)-7-[(Z)-2-(2-aminothiazol-4-yl)-2-(2-carboxyprop-2-oxyimino)acetamido]-3-(1-pyridiniummethyl)ceph-3-em-4-carboxylate or a non-toxic salt thereof.

4,258,042

ANTIHYPERTENSIVE PYRIDINES AND COMPOSITIONS

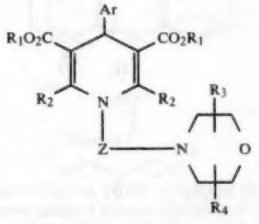
Bernard Loev, Scarsdale, N.Y., and James R. Shroff, Riverside, Conn., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Filed Apr. 11, 1980, Ser. No. 139,367

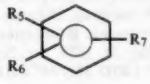
Int. Cl.[3] **A61K** *31/535;* **C07D** *295/14*

U.S. Cl. 424—248.5 **11 Claims**

1. A compound of the formula:



wherein Ar is heteroaryl, cycloalkyl having from 3 to 7 carbon atoms, naphthyl, indanyl, indenyl, tetrahydronaphthyl, or a radical of the formula



wherein each of R_5, R_6 and R_7 is independently H, alkyl, aryl, halo, lower alkoxy, nitro, amino, alkylmercapto, cyano, carboxy, carbalkoxy, sulfamyl, trifluoromethyl, hydroxy, acyloxy, methanesulfonyl, alkylamino or acylamino; and R_5 and R_6, when taken together, form a methylenedioxy; Z is alkylene containing 1 to about 5 carbon atoms in the principal chain; each R_1 is independently hydrogen, alkyl or alkoxyalkyl, with the proviso that only one R_1 may be hydrogen; R_2 is lower alkyl; and R_3 and R_4 are independently hydrogen or alkyl; wherein the alkyl, alkoxy, and acyl groups contain up to 10 carbon atoms, and their non-toxic, pharmaceutically-acceptable acid addition salts.

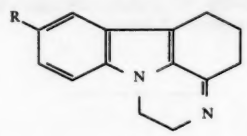
9. An anti-hypertensive composition comprising an effective amount of a compound according to claim **1** admixed with a pharmaceutically acceptable carrier.

4,258,043
PYRAZINO-CARBAZOLES, PROCESS FOR THE PRODUCTION THEREOF AND PHARMACEUTICAL AGENTS

Heinz Bender; Rudi Beyerle, both of Frankfurt am Main; Steffen Piesch, Oberursel, and Piero A. Martorana, Bad Homburg von der Hohe, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main-Fechenheim, Fed. Rep. of Germany

Filed Nov. 29, 1979, Ser. No. 98,608
Int. Cl.[3] **A61K** *31/495;* **C07D** *209/88, 493/16*
U.S. Cl. 424—250 **11 Claims**

1. A 2,4,5,6-tetrahydro-1H-pyrazino[3,2,1-jk]carbazole substituted in the 8-position and having the formula

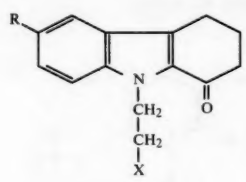


(I)

wherein R represents an alkyl or alkoxy group having 1 to 4 carbon atoms or a fluorine, chlorine or bromine atom, or a pharmaceutically-acceptable acid-addition salt thereof.

6. An antidepressant composition having an effective amount of a compound as set forth in claim **1** or **2** in combination with pharmaceutically-acceptable carrier.

9. A 6,9-disubstituted 1,2,3,4-tetrahydrocarbazol-1-one of the formula



(II)

wherein

R represents an alkyl or alkoxy group having 1 to 4 carbon atoms, a fluorine, chlorine or bromine atom and

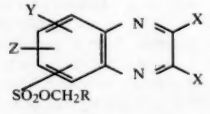
X means a chlorine, bromine or iodine atom.

4,258,044
FUNGICIDAL HALOALKYL POLYHALOQUINOXALINE SULFONATES

Thomas S. Woods, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 25, 1979, Ser. No. 42,554
Int. Cl.[3] **C07D** *241/44;* **A61K** *31/495*
U.S. Cl. 424—250 **43 Claims**

1. A compound having the formula



I

wherein

X is F, Cl, or Br;

R is fluoroalkyl of 1–4 carbon atoms and 1–9 fluorine atoms;

Y is H, F, Cl, Br, CH_3, CF_3, CCl_3, or NO_2; and

Z is H, F, Cl, Br, CH_3, CF_3, or CCl_3.

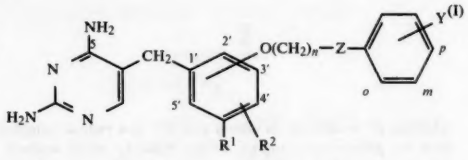
22. A fungicidal composition consisting essentially of a fungicidally effective amount of a compound of claim **1** and at least one of (a) a surfactant and (b) a suitable diluent.

4,258,045
INHIBITOR OF DIHYDROFOLATE REDUCTASE

Martin Poe, and William V. Ruyle, both of Scotch Plains, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 30, 1979, Ser. No. 99,167
Int. Cl.[3] **A61K** *31/505;* **C07D** *239/49, 239/49*
U.S. Cl. 424—251 **6 Claims**

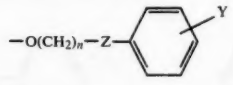
1. A compound of the structural formula:



(I)

Or pharmaceutically acceptable salt thereof, wherein:

(a)



and R^2 are independently at position 3' or 4';

(b) Z is oxy, imino, carbonyl, carbamoyl, thio, sulfinyl, sulfonyl or sulfamoyl;

(c) Y is at position o, p, or m and is hydrogen, amino, C_{1-3} alkylamino, C_{1-3} alkanamido, N-C_{1-3} alkylcarbamoyl, nitro or cyano;

(d) n is an integer ranging from 1 to 4; and

(e) R^1 and R^2 are independently hydrogen or C_{1-5} alkoxy.

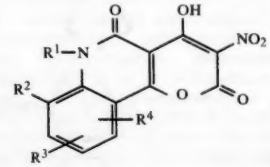
5. A method of treating bacterial infections, protozoal diseases and cancer comprising the administration to a mammalian species in need of such treatment an effective amount of a compound according to claim **1**.

4,258,046
PYRANO-HETEROCYCLES AND MEDICAMENTS CONTAINING THESE COMPOUNDS

Friedrich-Johannes Kämmerer, Hochheim am Main; Ulrich Gebert, Kelkheim, and Hans G. Alpermann, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,679
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1978, 2836470
Int. Cl.[3] **C07D** *491/06, 491/052;* **A61K** *31/47*
U.S. Cl. 424—258 **5 Claims**

1. A compound of the formula I



(I)

and a physiologically tolerated salt thereof, wherein

R^1 is hydrogen or alkyl having 1 to 4 carbon atoms,

R^2 is hydrogen or a radical selected from the group consist-

ing of alkyl, alkoxy or haloalkyl each having up to 3 carbon atoms, and halogen atoms, or

R^1 and R^2 together form an ethylene or propylene group,

R^3 and R^4, are, independently from each other, hydrogen or a radical selected from the group consisting of alkyl and alkoxy each having up to 3 carbon atoms being unsubstituted or at least partially substituted, with the same or different halogen atoms; halogen atoms; or alkoxycarbonyl groups having up to 3 carbon atoms in the alkyl radical.

4,258,047

PYRAZOLE DERIVATIVES, PHARMACEUTICAL FORMULATIONS THEREOF

Joachim Gante, Darmstadt-Arheilgen; Hans-Eckart Radunz, Mühltal; Dieter Orth, Darmstadt; Klaus Minck, Ober-Ramstadt; Albrecht Wild, Heppenheim, and Michael Klockow, Rossdorf, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

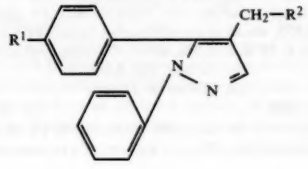
Filed Feb. 19, 1980, Ser. No. 122,795

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1979, 2906252

Int. Cl.[3] **A61K** *31/495, 31/415;* **C07D** *403/12, 401/12*

U.S. Cl. 424—250 **8 Claims**

1. A pyrazole derivative of the formula



wherein R^1 is H or Cl; R^2 is 1-methyl-4-piperidyloxycarbonyl, 2-(4-phenylpiperazino)-ethoxycarbonyl, benzoxazol-2-yl, benzthiazol-2-yl, tetrazol-5-yl or 3-R^3-4-R^4-thiazolidin-2-yl; R^3 is H, alkanoyl of 1–7 C atoms or benzoyl; and R^4 is H or COOH,

or a physiologically acceptable salt thereof.

4,258,048

SUBSTITUTED PYRIDINE METHYL ESTERS OF TETRAMETHYL CYCLOPROPANE CARBOXYLIC ACIDS AND THEIR USE AS INSECTICIDES

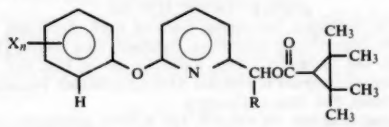
John C. Van Heertum, Concord, and Sudarshan K. Malhotra, Walnut Creek, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 62,452, Jul. 30, 1979. This application Apr. 21, 1980, Ser. No. 142,307

Int. Cl.[3] **C07D** *213/57;* **A01N** *43/40*

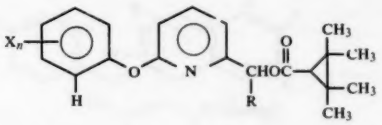
U.S. Cl. 424—263 **12 Claims**

1. A compound corresponding to the formula



wherein n represents an integer of 0 to 2; X independently represents nitro or cyano; and R represents hydrogen, cyano or ethynyl.

9. A method for the kill and control of insects which comprises contacting said insects or their habitat with a composition containing an inert carrier and as the active ingredient, an insecticidally effective amount of a compound corresponding to the formula



wherein n represents an integer of 0 to 2; X independently represents nitro or cyano; and R represents hydrogen, cyano or ethynyl.

4,258,049

INHIBITING PHENYLETHANOLAMINE N-METHYLTRANSFERASE WITH THIADIAZOLO AND OXADIAZOLOTETRAHYDROISOQUINOLINES

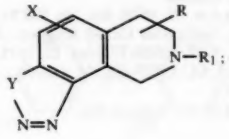
William E. Bondinell, Cherry Hill, N.J., and Gerald R. Girard, Cornwell Heights, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 54,343, Jul. 2, 1979, abandoned. This application Mar. 17, 1980, Ser. No. 130,662

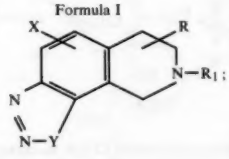
Int. Cl.[3] **A61K** *31/47;* **C07D** *498/04, 513/04*

U.S. Cl. 424—258 **14 Claims**

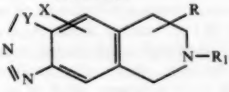
1. A chemical compound of the formula selected from the group consisting of:



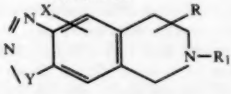
Formula I



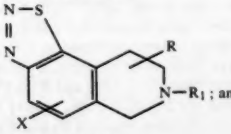
Formula II



Formula III

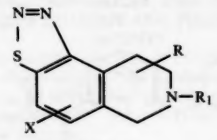


Formula IV



Formula V

-continued



Formula VI

in which:

Y is sulfur or oxygen;

when Y is sulfur, X is hydrogen, halogen, or trifluoromethyl, and R and R_1 are hydrogen or lower alkyl of from one to three carbon atoms; and

when Y is oxygen, X, R and R_1 are hydrogen; or a pharmaceutically acceptable acid addition salt thereof.

14. A method of inhibiting phenylethanolamine N-methyltransferase in the adrenal glands and simultaneously inhibiting the formation of epinephrine from norepinephrine in an animal which comprises administering to an animal requiring said inhibition a dosage unit containing from about 50 mg. to about 1000 mg. of a chemical compound as defined in claim **1**.

4,258,050

ANTIBACTERIAL AGENTS

John B. Harbridge, Coulsdon, England, assignor to Beecham Group Limited, England

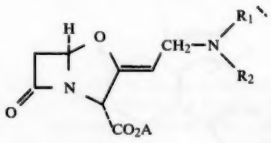
Filed Apr. 27, 1978, Ser. No. 900,541

Claims priority, application United Kingdom, Apr. 27, 1977, 17660/77; Aug. 5, 1977, 32835/77; Nov. 15, 1977, 47394/77

Int. Cl.[3] **C07D** *498/04, 413/06*

U.S. Cl. 424—272 **149 Claims**

1. A compound of the formula (II):



(II)

wherein A is a group such that CO_2A is carboxylic acid, a pharmaceutically acceptable salt thereof or an ester thereof and A is a group of the formula A_1 or CHA_2A_3 wherein A_1 is alkyl of 1 to 6 carbon atoms unsubstituted or substituted by alkoxy or acyloxy of 1 to 7 carbon atoms; A_2 is alkenyl of up to 5 carbon atoms or phenyl unsubstituted or substituted by fluorine, chlorine, bromine, nitro or alkyl or alkoxyl of up to 4 carbon atoms; and A_3 is hydrogen, alkyl of up to 4 carbon atoms or phenyl unsubstituted or substituted by fluorine, chlorine, bromine, nitro or alkyl or alkoxyl of up to 4 carbon atoms; R_1 is COR_4 or OR_5 wherein R_4 is lower alkyl, lower alkenyl, lower alkyl aryl or aryl and R_5 is CO_2R_6, COR_6 or SO_2R_6 wherein R_6 is lower alkyl, lower alkenyl, lower alkyl aryl or aryl; and R_2 is COR_8 wherein R_8 is lower alkyl, lower alkenyl, lower alkyl aryl or aryl; when R_1 is COR_4 and R_2 is COR_8, R_4 and R_8 are joined so that the $N(COR_4)$ COR_8 moiety is a 5-, 6-, or 7-membered heterocyclic ring or said ring to which is fused a phenyl ring unsubstituted or substituted by one or two lower alkyl, lower alkoxyl, fluorine or chlorine, wherein R_4 and R_8 are as above defined; when R_1 is OR_5 and R_2 is COR_8, R_5 and R_8 are joined so that the $N(OR_5)$ COR_8 moiety is a 5-, 6-, or 7-membered heterocyclic ring, wherein R_5 and R_8 are as above defined.

4,258,051

METHOD OF TREATING VIRAL INFECTIONS

James P. Davidson, Lansing; Barnett Rosenberg, Holt, both of Mich., and Ronald W. Hinz, Avoca, Iowa, assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 540,109, Jan. 10, 1975, which is a continuation of Ser. No. 350,929, Apr. 13, 1973, abandoned. This application Mar. 1, 1977, Ser. No. 773,216

Int. Cl.[3] **A61K** *31/28, 31/555*

U.S. Cl. 424—287 **3 Claims**

1. A method for treating an animal afflicted with a viral infection comprising administering by injection to said animal an effective anti-viral amount of a platinum coordination compound selected from the group consisting of malonatoethylenediamine platinum(II), methylmalonatoethylenediamine platinum (II), ethylmalonatoethylenediamineplatinum (II), malonatodiammineplatinum (II), methylmalonatodiammineplatinum (II), ethylmalonatodiammine platinum (II), bismalonatodiammine platinum (IV), bismethylmalonatodiammine (IV), and bisethylmalonatodiammineplatinum (IV).

4,258,052

TREATMENT OF PSORIASIS WITH NICOTINAMIDE ANALOGUES

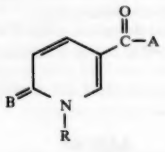
Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002, and Eugene J. Van Scott, 1138 Sewell La., Rydal, Pa. 19046

Continuation-in-part of Ser. No. 715,131, Aug. 17, 1976, Pat. No. 4,141,977, which is a continuation-in-part of Ser. No. 601,411, Aug. 4, 1975, Pat. No. 4,067,975. This application Feb. 5, 1979, Ser. No. 9,589

Int. Cl.[3] **A61K** *31/455*

U.S. Cl. 424—266 **23 Claims**

1. A composition useful in the treatment of psoriasis comprising: an antipsoriatic effective amount of a compound of the formula:



wherein

R is an alkyl or aryl radical having from 1 to 9 carbon atoms;

A is OH, or an alkoxy radical having from 1 to 9 carbon atoms; and

B is O in a pharmaceutically acceptable lotion, cream, or ointment for topical application.

4,258,053

THIENYL-PROSTAGLANDINS AND PROCESS FOR THEIR MANUFACTURE

Wilhelm Bartmann, Neuenhain; Gerhard Beck, Frankfurt am Main; Dieter-Bernd Reuschling, Butzbach; Karl Seeger, Hofheim, and Hermann Teufel, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

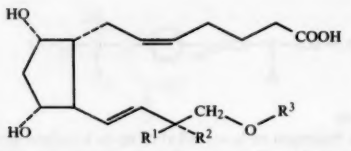
Continuation of Ser. No. 692,272, Jun. 3, 1976, abandoned. This application Apr. 3, 1980, Ser. No. 136,982

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1975, 2524955

Int. Cl.[3] **C07D** *333/32;* **C07C** *177/00*

U.S. Cl. 424—275 **3 Claims**

1. A racemic compound, or an opbically active compound of natural configuration, of the formula



physiologically acceptable salts thereof with organic or inorganic bases, and esters thereof with aliphatic, cycloaliphatic, or araliphatic alcohols having up to 8 carbon atoms, wherein R^1 and R^2 each is hydrogen or hydroxy but R^1 and R^2 are different; and R^3 is α-thienyl, β-thienyl, or α-or β-thienyl mono-, di-, or tri-substituted by at least one member selected from the group consisting of chloro, trifluoromethyl, or methyl.

4,258,054

HYDANTOIN DERIVATIVES AS THERAPEUTIC AGENTS

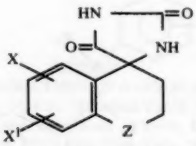
Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 923,105, Jul. 10, 1978, Pat. No. 4,209,630, which is a division of Ser. No. 767,805, Feb. 11, 1977, Pat. No. 4,117,230, which is a continuation of Ser. No. 733,062, Oct. 18, 1976, abandoned. This application Sep. 4, 1979, Ser. No. 71,871

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 R **6 Claims**

1. A method of treating a diabetic host to prevent or alleviate ocular and neuritic diabetes-associated chronic complications, which comprises orally, parenterally or topically administering to said host an effective amount of a compound selected from the group consisting of spiro-hydantoins of the formula:



and the base salts thereof with pharmacologically acceptable cations, wherein Z is $-(CH_2)_n-$;

X is hydrogen and X^1 is hydrogen, hydroxy, fluorine, chlorine, bromine, lower alkyl or lower alkoxy; or

X and X^1, when taken separately, are each chlorine, lower alkyl or lower alkoxy and when taken together are $-OCH_2(CH_2)_nO-$; and n is zero or one.

4,258,055

PHARMACEUTICAL COMPOSITIONS

Andrea Lietti, and Attilio Bonati, both of Milan, Italy, assignors to Inverni Della Beffa S.p.A., Milan, Italy

Division of Ser. No. 881,892, Feb. 27, 1978, which is a continuation-in-part of Ser. No. 829,912, Sep. 1, 1977, abandoned. This application Jul. 20, 1979, Ser. No. 59,183

Claims priority, application United Kingdom, Sep. 8, 1976, 37252/76

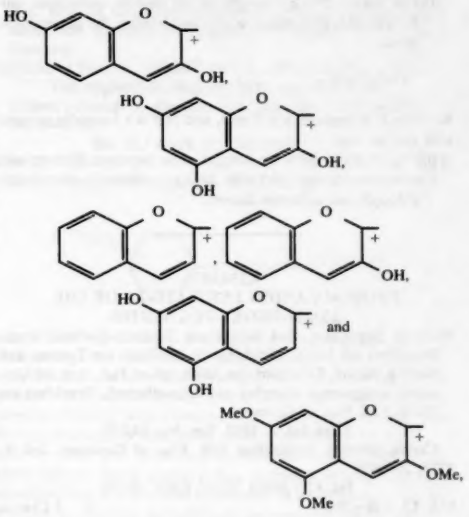
Int. Cl.³ A61K *31/35*

U.S. Cl. 424—283 **5 Claims**

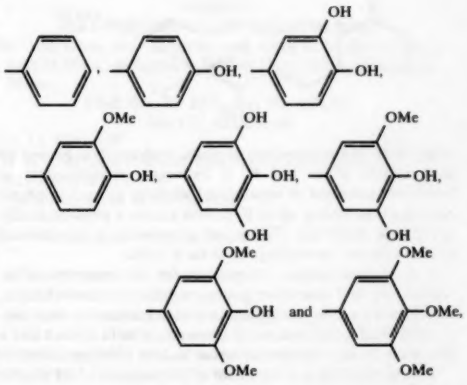
1. A method of eliciting a cicatrizing response in a subject in need of a cicatrizing response, which comprises administering to the subject an effective dose of a flavylium salt of the structure

$A^+—B\ X^-$

containing at least one hydroxy or methoxy substituent and wherein A^+ is selected from the group consisting of



B is selected from the group consisting of



and X^- is a pharmaceutically acceptable anion.

4,258,056

CONTROL OF MASTITIS AND COMPOSITIONS THEREFOR

Steven E. Lentsch, St. Paul, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 970,653, Dec. 18, 1978, which is a continuation-in-part of Ser. No. 880,335, Feb. 23, 1978, abandoned. This application Apr. 19, 1979, Ser. No. 31,429

Int. Cl.³ A61K *31/255, 31/24*

U.S. Cl. 424—303 **13 Claims**

1. A method for killing mastitis-causing organisms on an animal's teats, wherein control over the organisms can be obtained in less than 15 minutes, said method comprising the step of treating the teats of the animal with a composition containing a major amount of water, having a pH above 4 and below 6.5 at 23° C., and consisting essentially of:

(a) at least about 0.1% by weight of an aminocarboxylic acid or aminocarboxylate chelating agent having a calcium chelate stability constant of at least about 6;

(b) at least 0.5% by weight of an anionic surfactant uniformly distributable in water and having the general formula

$$LSO_x^{\ominus}N^{\oplus}$$

wherein L is organic, x is 3 or 4, and $N^{\oplus}$ is a topically acceptable cation; and

(c) up to about 98% by weight of an aqueous diluent; said components (a) and (b) being uniformly distributed through said aqueous diluent.

4,258,057

PROSTAGLANDIN DERIVATIVES OF THE Δ2,4-11-DEOXY-PEG SERIES

Wilhelm Bartmann, Bad Soden am Taunus; Gerhard Beck, Frankfurt am Main; Ulrich Lerch, Hofheim am Taunus, and Martin Bickel, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

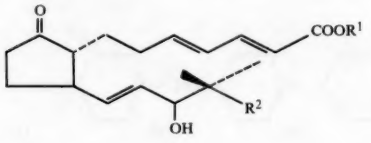
Filed Jul. 5, 1979, Ser. No. 54,874

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1978, 2830079

Int. Cl.[3] **A01N** *37/00;* **C07C** *69/74*

U.S. Cl. 424—305 **3 Claims**

1. A compound of the formula



wherein R^2 is straight-chain aliphatic hydrocarbon having up to 6 carbon atoms and R^1 is hydrogen, straight-chain or branched, saturated or unsaturated aliphatic or cycloaliphatic hydrocarbon having up to 10 carbon atoms, a physiologically acceptable metal ion, NH_4+, or an ammonium ion derived from a primary, secondary, or tertiary amine.

2. A pharmaceutical composition for the treatment of inflammatory and ulcerative gastrointestinal muscosal changes, which composition comprises an anti-inflammatory and anti-ulcerative effective amount of a compound as in claim **1** and a pharmaceutically acceptable carrier and/or stabilizer therefor.

3. A method for the treatment of inflammatory and ulcerative gastrointestinal mucosal changes, which method comprises administering an anti-inflammatory and anti-ulcerative effective amount of a compound as in claim **1**.

4,258,058

PHENOXYALKYLCARBOXYLIC ACID COMPOUNDS AND THROMBOCYTE-AGGREGATION INHIBITION

Ernst-Christian Witte, Mannheim; Hans P. Wolff, Hirschberg-Grossachsen; Max Thiel, Mannheim; Karlheinz Stegmeier, Schriesheim, and Egon Roesch, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

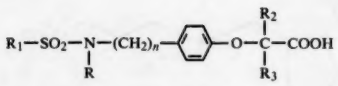
Filed Feb. 26, 1979, Ser. No. 15,536

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809377

Int. Cl.[3] **C07C** *143/78;* **A61K** *31/195, 31/24*

U.S. Cl. 424—309 **20 Claims**

1. Phenoxyalkylcarboxylic acid compound of the formula



(I)

wherein

R is hydrogen or lower alkyl of up to 6 carbon atoms

R_1 is aryl, aralkyl or aralkenyl wherein the aryl moiety contains from 6 to 14 carbon atoms, and the alkyl or alkenyl moiety contains up to 5 carbon atoms and wherein said aralkyl and aralkenyl is optionally substituted with at least one substituent selected from halogen, hydroxyl, trifluoromethyl, alkyl or alkoxy of up to 5 carbon atoms, and alkanoyl of up to 5 carbon atoms

R_2 and R_3 are individually selected from hydrogen or lower alkyl of up to 6 carbon atoms, and n is 0, 1, 2 or 3 or the physiologically acceptable salt or lower alkyl ester thereof.

17. Phenoxyalkylcarboxylic acid compound as claimed in claim **1** designated 4-[3-(phenylsulfonylamino)-propyl]-phenoxyacetic acid.

4,258,059

AMINO-BENZAMIDES

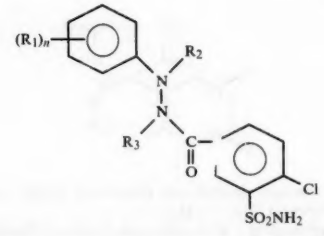
Joseph Auerbach, Brooklyn, and Martin L. Kantor, Mamaroneck, both of N.Y., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Continuation-in-part of Ser. No. 969,653, Dec. 15, 1978, abandoned. This application Jun. 21, 1979, Ser. No. 50,806

Int. Cl.[3] **A61K** *31/18;* **C07C** *143/79*

U.S. Cl. 424—321 **9 Claims**

1. A compound of the formula



wherein

R_1 is independently halogen, lower alkyl or trifluoromethyl,

n is an integer from 0 to 2,

R_2 is lower alkenyl, lower alkynyl, or cycloalkyl, and

R_3 is hydrogen or lower alkyl

wherein

the alkyl, alkenyl, and alkynyl groups contain up to 6 carbon atoms and the cycloalkyl groups contain from 3 to 7 carbon atoms.

9. A method of treating hypertension which comprises administering to animals having hypertension an effective dose of a compound of claim **1**.

4,258,060

SUBSTITUTED TRICHLOROPROPYLUREAS AS PLANT DISEASE CONTROL AGENTS

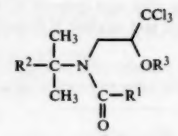
Steven J. Goddard, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 13, 1979, Ser. No. 65,864

Int. Cl.[3] **A01N** *37/20, 37/18;* **C07C** *103/38, 127/00*

U.S. Cl. 424—322 **9 Claims**

1. A compound of the formula



(I)

wherein

R^1 is CH_3NH, CH_3O, or CH_3;

R^2 is CH_3 or $HC{\equiv}C$; and

R^3 is H or

provided that when R^2 is $HC{\equiv}C$, R^1 is CH_3NH and R^3 is H; ps and provided that when R^3 is

R^1 is CH_3NH and R^2 is CH_3.

7. A method for controlling fungus diseases of living plants which comprises applying to the locus to be protected a fungicidally effective amount of a compound of cl...n 1.

4,258,061

INTERFERON INDUCTION IN ANIMALS BY AMINES

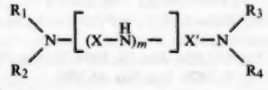
Timothy H. Cronin, Niantic; Hermann Faubl, Groton; William W. Hoffman, Mystic, and James J. Korst, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 687,514, May 18, 1976, Pat. No. 4,087,552, which is a division of Ser. No. 541,240, Jan. 15, 1975, abandoned, which is a division of Ser. No. 330,042, Feb. 6, 1973, Pat. No. 3,872,171, which is a continuation-in-part of Ser. No. 146,548, May 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 62,192, Aug. 7, 1970, abandoned. This application Feb. 13, 1978, Ser. No. 877,116

Int. Cl.³ A61K *31/13, 31/135, 31/495*

U.S. Cl. 424—325 **6 Claims**

1. A process for combating viral infections in a vertebrate animal which comprises parenterally, intranasally or topically administering to the animal an antivirally effective amount of a composition containing as the essential active ingredient a compound of the formula



and the non-toxic acid addition salts thereof wherein

R_1 and R_2 are each alkyl of from 12 to 20 carbon atoms;

R_3 is hydrogen;

R_4 is selected from the group of hydrogen and hydroxyalkyl of from 2 to 8 carbon atoms; and

X' is straight chain alkylene of from 2 to 6 carbon atoms.

4,258,062

PHENOXY-AMINO-PROPANOLS

Rochus Jonas; Karl-Heinz Becker; Hans-Joachim Enenkel; Klaus Minck, and Hans-Jochen Schliep, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

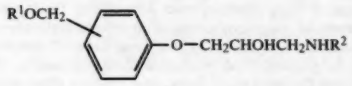
Division of Ser. No. 839,487, Oct. 4, 1977, Pat. No. 4,171,370. This application May 30, 1979, Ser. No. 43,925

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645710

Int. Cl.³ A61K *31/135;* **C07C** *93/06*

U.S. Cl. 424—330 **9 Claims**

1. Phenoxy-amino-propanols of the formula



wherein R^1 is p-alkoxyalkyl with 2–6 C atoms; and R^2 is alkyl or hydroxyalkyl with 1–6 C atoms in each case, cycloalkyl with 3–8 C atoms or aralkyl or aralkyl wherein the aryl radical is mono- to tri-substituted by alkyl, alkoxy, OH, F, Cl or combinations thereof, with a total of 7–15 C atoms in each case, and the physiologically acceptable acid addition salts thereof.

8. A method of achieving isoprenaline antagonism on the heart rate or blood pressure in a mammal, which comprises administering to a mammal an amount of a compound of claim 1 which is effective for achieving isoprenaline-antagonism on the heart rate or blood pressure.

4,258,063

SELF-EMULSIFYING COSMETIC BASE

Ho-Ming Chun, New Brighton, and Allan L. Melby, Andover, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Jun. 23, 1978, Ser. No. 918,260

Int. Cl.³ A61K *7/48*

U.S. Cl. 424—365 **8 Claims**

1. A solid form cosmetic base having self-emulsifying properties consisting of:

(a) a compound of the formula:

$$MOOCCH_2CH_2NRCH_2CH_2COOM$$

where R is a fatty alkyl having from about 10 to about 24 carbon atoms, and;

(b) a saturated fatty alcohol having from about 10 to about 24 carbon atoms

wherein the weight ratio of component (a) to component (b) is from about 1/10:1 to about 2/13:1 and M is selected from the group consisting of salt forming cations and hydrogen in a respective weight ratio of from about $1:10^0$ to about $1:10^{-10}$.

4,258,064

PREPARATION OF A NON-FAT NATURALLY SWEET YOGURT

Thomas S. Michener, Jr., 1055 Woods Rd., Southampton, Pa. 18966

Filed Jan. 8, 1979, Ser. No. 2,080

Int. Cl.³ A23C *9/12*

U.S. Cl. 426—43 **12 Claims**

1. In a process for preparing a yogurt product having less than 0.5% butter fat content based on the weight of the solids by incubating an aqueous composition containing non-fat milk solids in the presence of lactic acid-producing microorganisms at a suitable incubation temperature, the improvement in which said non-fat milk solids are caramelized, said non-fat milk being caramelized by heating a mixture of water and about 22–37% by weight of non-fat milk solids, based on the

total weight of the mixture, to a temperature of 165°–185° F. for a period of about 2–10 minutes, whereby the yogurt product which is prepared after incubation is naturally sweet.

4,258,065

MATERIAL FOR COATING BAIT

Stephen B. Ciulla, 21 MacKenzie Lane, Wakefield, Mass. 01880

Division of Ser. No. 914,335, Jun. 12, 1978, Pat. No. 4,143,161. This application Oct. 23, 1978, Ser. No. 953,601

Int. Cl.³ A01G *5/06*

U.S. Cl. 426—1 **4 Claims**

1. A mixture for coating bait to improve the handling thereof, said mixture comprising a hardwood flour that forms a relatively fine, dry powder, is absent any substantial oil tar and maintains its color with aging, in combination with dehydrated ground food product, said dehydrated food product selected from the group consisting of powdered earthworms or shellfish, and said mixture having on the order of 25 percent by weight of dehydrated food product with the remainder of the mixture being the hardwood flour, said mixture after application to the bait adapted to dislodge from the bait with the food product performing a means for attracting the fish.

4,258,066

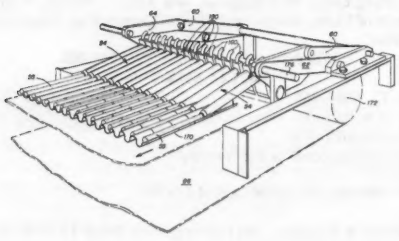
PROCESS FOR EXTRUDING AND FORMING PORTION CONTROLLED FROZEN FOOD

Vincent E. Bernard, Richardson, Tex., assignor to The Jimmy Dean Meat Company, Inc., Dallas, Tex.

Continuation of Ser. No. 832,200, Sep. 12, 1977, abandoned, which is a division of Ser. No. 610,301, Sep. 4, 1975, Pat. No. 4,124,339, which is a continuation-in-part of Ser. No. 526,146, Nov. 22, 1974. This application Dec. 18, 1978, Ser. No. 970,367

Int. Cl.³ A01K *43/00*

U.S. Cl. 426—231 **13 Claims**



1. The method of producing discrete food products having a selected weight comprising:

forming a semi-fluid mixture of the product,

pumping said mixture to an extrusion location,

sensing the flow of fluid pumped to the extrusion location,

controlling the pumping of the fluid in response to the flow to provide a uniform flow to the extrusion location,

extruding said mixture into and through a pluraltiy of nozzles onto a moving conveyor, thereby forming the mixture into a plurality of elongated continuous lengths having a preselected substantially cylindrical uniform cross section along the length thereof,

metering the flow from the extrusion location to provide a uniform flow of semi-fluid from the extrusion location,

directing said continuous length of said semi-fluid mixture through a chilling location to chill and firm the preselected cross-sectional shape of said lengths until said lengths maintain their cross-sectional shape without support,

supporting said uniform cross-section after extrusion from said nozzles and during passage through said chilling location by the use of a structure connected to said conveyor which conforms to the shape of the bottom and at least a portion of the sides of the uniform cross-section of said extruded mixture, said structure extending along a length of and moving with said cross-section to maintain said cross-section until said mixture is firmed by chilling, and

dividing said lengths at periodic intervals to form a plurality of products having the same selected weight.

4,258,067

METHOD FOR INTRODUCING A PULVERULENT MATERIAL INTO MEAT OR THE LIKE

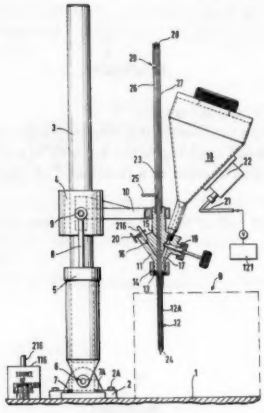
Dieter Stoll, Winterbach, and Oswald Kunz, Marpingen, both of Fed. Rep. of Germany, assignors to Ludwig Scheid GmbH Spezialpräparate und Gewurze zur Fleischverarbeitung, UM./U/ berherrn, Fed. Rep. of Germany

Filed Sep. 7, 1978, Ser. No. 940,187

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1977, 2740429

Int. Cl.³ A23L *1/31;* **G01F** *11/00*

U.S. Cl. 426—281 **10 Claims**



1. A method of introducing a powder into a puncturable body, comprising the steps of introducing into the body a hollow needle wherein the needle forms a hole in the body; admitting powder into the needle by gravity flow to form a column of powder in the needle; applying to said column at its trailing end a gaseous pressure which exceeds the pressure prevailing at the region of the leading end of the needle but is less than that pressure at which the powder would penetrate into and expand the body in the region of the inserted needle, said gaseous pressure also being less than that pressure which would cause any substantial compacting of the powder in the hole; and withdrawing the needle while continuing said pressure applying step so that the substantially uncompacted column of powder remains in the hole formed by the needle.

4,258,068

PROCESS FOR PRODUCTION OF A RESTRUCTURED FRESH MEAT PRODUCT

Dale L. Huffman, Auburn, Ala., assignor to Auburn Research Foundation, Auburn, Ala.

Division of Ser. No. 872,024, Jan. 24, 1978. This application Jun. 7, 1979, Ser. No. 46,385

The portion of the term of this patent subsequent to Jul. 1, 1997, has been disclaimed.

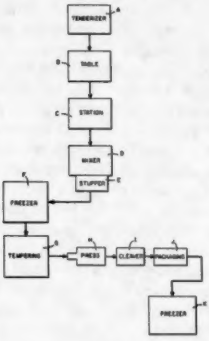
Int. Cl.³ A23L *1/31*

U.S. Cl. 426—272 **8 Claims**

1. A method of restructuring fresh meat comprising the steps of:

providing fresh, unheated meat to be restructured;

boning said meat;
mechanically tenderizing said unheated fresh meat a plurality of times to release binding materials from said meat and to tenderize said meat;
freezing said meat;
tempering said meat to an internal temperature of approximately 26° F.;
slicing said tempered meat into thin wafers;
defatting other meat;
tenderizing said other meat on a mechanical tenderizer;
cutting said tenderized other meat into cubes;



removing excess connective tissue and gristle from said cubes by cutting;
combining said meat wafers and said meat cubes by mixing said meat wafers and said meat cubes;
blending said mixed meats;
preforming said blended meats into an initial desired shape;
wrapping said preformed meats with a film-like material;
freeze tempering said wrapped preformed meats such that said meats remain deformable;
pressing said frozen meats into a final desired shape;
slicing said pressed frozen meats into a plurality of slices; and
freezing said slices.

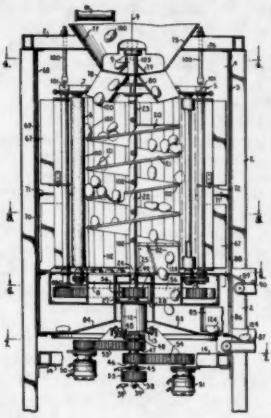
4,258,069

METHOD FOR CONTINUOUS PRODUCE SURFACE TREATMENT

John H. Amstad, Alameda, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Filed Feb. 12, 1979, Ser. No. 11,392
The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.
Int. Cl.³ A23N *7/00*
U.S. Cl. 426—483 **7 Claims**

2. The method of removing material from the surface of produce comprising the steps of:
(a) urging said produce into engagement with rotating spindles having a material removing surface thereon,
(b) maintaining said produce in a circular path of rotation at a speed sufficient to maintain said produce engaged with said rotating spindles through centrifugal force;
(c) moving said produce downwardly and longitudinally of said spindles under the force of gravity,
(d) resisting said downward movement of said produce by contacting said produce with an effectively downward moving supporting area, said supporting area taking the form of a substantially continuous spiral surface, and
(e) effectively lowering said supporting area, with the produce in contact therewith, at a predetermined rate, thereby utilizing both gravity and said supporting area for



controlling the period of produce descent along said spindles.

4,258,070

METHOD FOR INHIBITING MICROBIAL GROWTH IN FOOD PROCESSES

John A. Ridgway, Jr., La Porte, Ind., and William P. Weisrock, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 810,293, Jun. 27, 1977, abandoned. This application Oct. 4, 1978, Ser. No. 948,331
Int. Cl.³ C12C *11/24;* C12B *1/24;* C12N *1/16, 1/04*
U.S. Cl. 426—495 **14 Claims**

1. A method for inhibiting microbial contamination occurring in a process for producing heat sensitive materials, said method comprising cycling the temperature of any portion of the process which is a source of contamination between upper and lower limits falling in the range between 0° and 60° C. and at a frequency of from about 0.2 to about 5 cycles per hour, said upper and lower limits being at least 5° C. apart.

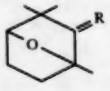
4,258,071

1,4-EPOXY-1,3,3-TRIMETHYL-2-(2-BUTEN-1-YLIDENE)-CYCLOHEXANES AS FLAVORANTS

Roman Kaiser, Uster, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 924,030, Jul. 12, 1978. This application Aug. 14, 1979, Ser. No. 66,360
Claims priority, application Luxembourg, Jul. 25, 1977, 77834; Switzerland, May 19, 1978, 5464/78
Int. Cl.³ A23L *1/226*
U.S. Cl. 426—536 **2 Claims**

1. A flavoring composition comprising a chemically synthesized compound of the formula



wherein R represents the 2-cis or the 2-trans-buten-1-yl-idene group in an amount effective to impart fresh, green and spicy nuances to the composition and at least one other flavoring compound.

4,258,072
MIXED SEASONING

Hajime Eguchi, Yokohama; Hideko Furukawa, Tokyo; Toshiaki Miyanishi, Yokosuka, and Makoto Sakaguchi, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jun. 21, 1979, Ser. No. 50,516
Claims priority, application Japan, Jun. 21, 1978, 53-74965
Int. Cl.³ A23L *1/229*
U.S. Cl. 426—537 **4 Claims**

1. A mixed seasoning, comprising:
(a) 100 parts by wt. monosodium glutamate;
(b) 0.05 to 25 parts by wt. of a flavor incuding 5'-nucleotide;
(c) 5.0 to 38.0 parts by wt. table salt;
(d) 0.1 to 0.87 parts by wt. succinic acid and/or sodium succinate; and
(e) 0.5 to 10.0 parts by wt. of at least one alkali salt of an organic acid selected from the group consisting of sodium fumarate, sodium citrate, sodium or calcium lactate, sodium maleate, sodium tartrate, and sodium ascorbate.

4,258,073
TAKING OF FINGER PRINTS

John M. Payne, 36A High St., Maxey, Peterborough, England

Filed Feb. 28, 1979, Ser. No. 16,019
Claims priority, application United Kingdom, Mar. 2, 1978, 8239/78
Int. Cl.³ A61B *5/10*
U.S. Cl. 427—1 **9 Claims**

1. A method of rendering visible a fingerprint contained on an area comprising the steps of:
(1) covering the area with a flexible sheet which is sensitive to skin oil secretions and capable of retaining an electrostatic charge,
(2) firmly pressing the sheet into contact with the said area,
(3) separating the sheet from the said area,
(4) subjecting the sheet to an electrostatic field so as to impart an electrostatic charge thereover which will be less in areas bearing skin secretions of the fingerprint,
(5) removing the electrostatic field, and
(6) applying to the sheet a finely divided particulate material so that the particles adhere to strongly charged regions of the sheet but areas having little or no charge are substantially uncoated by the particles thereby to produce a pattern corresponding to the fingerprint.

4,258,074
PROCESS FOR THE ENCRUSTING, PILLING OR GRANULATING OF SEED MATERIAL

Hans Grimm, Meinhard, and Ralf Dabrowski, Hilden, both of Fed. Rep. of Germany, assignors to Saat-und Erntetechnik GmbH, Eschwege, Fed. Rep. of Germany

Filed Oct. 25, 1978, Ser. No. 954,617
Int. Cl.³ A01G *5/06*
U.S. Cl. 427—4 **5 Claims**

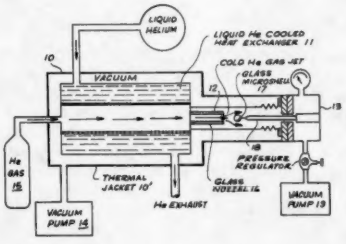
1. In a process for the gas and liquid-permeable encrusting, pilling or granulating of seed material through the use of a laminar material comprising a three-layer mineral which is expandable under the effect of a liquid, the improvement comprising: encrusting, pilling or granulating seed material with a three-layer mineral comprising a basic material which is a fine-grained reversibly expandable material adapted to rapidly absorb or give off polar liquids, such as water, said basic material including lamellar particles in the form of extremely thin, uniformly even platelets comprising over 50% of said material by weight, having a thickness of from 0.5 to 10 microns and surface dimensions corresponding to an equivalent diameter of 10 to 200 microns and a particle thickness: equivalent diameter ratio equal to or less than 1:10, said particles possessing hydrophilic properties at their planar surfaces; and forming extensively cohesive and adhesive coatings when dried out of an aqueous mass, said three-layer mineral having a dry mass of 35 to 65% by weight relative to the total weight of the moist mass so as to evidence a substantial plasticity with a permeability to gases and liquids at a coating thickness of up to about 5 mm, said basic material being obtained by the expansion of a three-layer mineral selected from the group consisting of vermiculite or hydrous mica with a polar liquid followed by structure-protective mechanical fragmentation of the expanded mineral to provide a mineral of the aforestated characteristics.

5. A laminar material for the gas and liquid-permeable encrusting, pilling or granulating of seed material, said laminar material comprising a three-layer mineral which is expandable under the effect of a liquid, said three-layer mineral comprising a basic material which is a fine-grained reversibly expandable material adapted to rapidly absorb or give off polar liquids, such as water, said basic material including lamellar particles in the form of extremely thin, uniformly even platelets comprising over 50% by weight of said material, having a thickness of from 0.5 to 10 microns and surface dimensions corresponding to an equivalent diameter of 10 to 200 microns and a particle thickness equivalent diameter ratio equal to or less than 1:10, said particles possessing hydrophilic properties at their planar surfaces; and forming extensively cohesive and adhesive coatings when dried out of an aqueous mass, said three-layer mineral having a dry mass of 35 to 65% by weight relative to the total weight of the moist mass so as to evidence a substantial plasticity with a permeability to gases and liquids at a coating thickness of up to about 5 mm, said basic material being obtained by the expansion of a three-layer mineral selected from the group consisting of vermiculite or hydrous mica with a polar liquid followed by structure-protective mechanical fragmentation of the expanded mineral to provide a mineral of the aforestated characteristics.

4,258,075
CRYOGENIC TARGET FORMATION USING COLD GAS JETS

Charles D. Hendricks, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 20,121, Mar. 13, 1979, Pat. No. 4,190,016.
This application Oct. 11, 1979, Ser. No. 84,023
Int. Cl.³ G21B *1/00*
U.S. Cl. 427—6 **4 Claims**



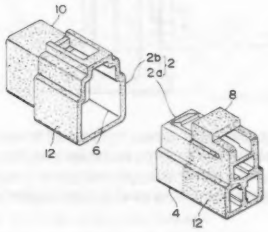
1. A method for forming at least one substantially uniform layer of cryogenic materials on an inner surface of at least one hollow spherical member comprising the steps of: directing jets of cold gas onto the spherical member, the cold gas having a temperature below the solidification point of the cryogenic materials; applying heat to the cryogenic materials by heating the jets of gas, directed onto the spherical member, to a temperature which allows vaporization of the cryogenic material; and refreezing the cryogenic materials to form a substantially uniform frozen layer thereof within the spherical member by lowering the temperature of said gas.

4,258,076

METHOD OF MANUFACTURING NOISE REDUCTION CONNECTORS

Mitsugu Watanabe, Numazu, and Tomoyuki Hirano, Gotenba, both of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 870,572, Jan. 18, 1978, abandoned. This application Nov. 20, 1978, Ser. No. 961,962
Claims priority, application Japan, Jan. 28, 1977, 52-7658
Int. Cl.[3] B05D *1/04, 1/06, 5/00*
U.S. Cl. 427—14.1 7 Claims



1. A method of manufacturing noise-reducing electrical connectors, which comprises the steps of: blowing pulverized dielectric fiber pieces into an elongated zone defined between a pair of spaced-apart electrodes while applying a predetermined, high, voltage difference between said electrodes, and thereby forming an omnidirectional free-moving cloud of said fiber pieces in said zone; coating exposed surface portions of electrical connectors with wet adhesive, and while the adhesive is still wet, moving said adhesive-coated electrical connectors individually and in spaced-apart relation to each other longitudinally through said zone between said electrodes and through said cloud of fiber pieces present in said zone so that the individual adhesive-coated electrical connectors are surrounded by said cloud as said connectors move through said zone whereby fiber pieces adhere to the adhesive on said surface portions of said electrical connectors and form a fiber coating thereon; then removing said electrical connectors from said zone and said cloud of fiber pieces and drying said adhesive to fix said fiber coating on said surface portions of said electrical connectors.

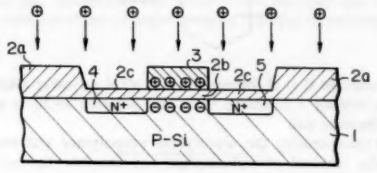
7. A method of manufacturig noise-reducing electrical connectors each comprised of an assembly of a male connector member and a female connector member having interfitting male and female surface portions, which comprises the steps of: blowing pulverized dielectric fiber pieces into an elongated zone defined between a pair of spaced-apart electrodes while applying a predetermined, high, voltage difference between said electrodes, and thereby forming an omnidirectional free-moving cloud of said fiber pieces in said zone; coating exposed surface portions of said electrical connectors with a first coating of wet adhesive, and while the adhesive is still wet, moving sid adhesive-coated electrical connectors individually and in spaced-apart relation to each other longitudinally through said zone between said electrodes and through said cloud of fiber pieces present in said zone so that the individual adhesive-coated electrical connectors are surrounded by said cloud as said connectors move through said zone whereby fiber pieces adhere to the adhesive on said surface portions of said electrical connectors and form a first fiber coating thereon; then removing said electrical connectors from said zone and said cloud of fiber pieces and drying said adhesive to fix said fiber coating on said surface portions of said electrical connectors; then disconnecting said male and female connector members from each other; then coating the interfitting surface portion of at least one of said male and female connector members of each connector with a second coating of wet adhesive, and while the second adhesive coating is still wet, forming a second fiber coating on said adhesive-coated interfitting surface portions in the same manner as the manner in which said first fiber coating was formed and wherein the fiber pieces of said second coating are not longer than the fiber pieces in said first fiber coating; and then drying said second coating of adhesive to fix said second fiber coating on said interfitting surface portions.

4,258,077

METHOD OF ION IMPLANTATION INTO A SEMICONDUCTOR SUBSTRATE PROVIDED WITH AN INSULATING FILM

Haruhisa Mori, and Motoo Nakano, both of Yokohama, Japan, assignors to Fujitsu Limited, Tokyo, Japan

Filed Oct. 26, 1979, Ser. No. 88,468
Claims priority, application Japan, Oct. 30, 1978, 53-133623
Int. Cl.[3] C23C *17/00*
U.S. Cl. 427—38 12 Claims



1. In the method of ion implantation into a semiconductor substrate through an insulating layer wherein, as a result of said implantation, a surface potential is developed on said insulating layer, the steps comprising:

beginning said implantation at a maximum ion beam current at which the peak value of the surface potential of said insulating layer is below a destructive level, and;

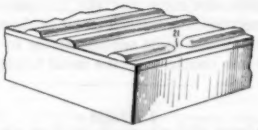
thereafter at least once increasing the ion beam current but at all times maintaining said current at a level such that the surface potential remains below said destructive level.

4,258,078

METALLIZATION FOR INTEGRATED CIRCUITS

George K. Celler, Summit, and Thomas E. Seidel, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 917,841, Jun. 22, 1978, abandoned. This application Dec. 21, 1979, Ser. No. 105,918
Int. Cl.[3] B05D *3/06*
U.S. Cl. 427—43.1 13 Claims



1. A method for making integrated circuits comprising: forming at least portions of a multiplicity of devices in a semiconductor wafer, forming conductive interconnections between two or more devices by the steps of: applying a uniform coating of conductive material over a substantial portion of the wafer, lithographically masking the wafer over the desired interconnections leaving unwanting portions unmasked, and removing the unwanted portions to form a metallization pattern, the improvement comprising the further step of shaping the edges and/or corners of the metallization pattern by exposing them to laser or electron beam radiation, of sufficient power to melt the conductive material at said edges and/or corners for a period of time, said period of time being short enough to avoid substantial flow of the conductive material.

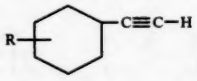
4,258,079
PREPARATION OF CONTINUOUS FILMS OF DIACETYLENIC POLYMERS

James Economy; Mary Ann Flandera, and Cheng-Yih Liu, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1979, Ser. No. 103,245
Int. Cl.[3] B05D *3/02, 3/06, 3/12*
U.S. Cl. 427—44 7 Claims

1. A process for preparing a continuous film of a diacetylene polymer, said process comprising the steps of:

(1) forming a solution of a diacetylenic prepolymer in a solvent which is liquid phenylacetylene compound having the formula:



wherein R is H, halogen, lower alkyl or lower alkoxy;

(2) coating a substrate with said solution to form a film thereon; and

(3) cross-linking the diacetylene prepolymer and reacting the residual phenylacetylene solvent into the polymer structure.

3. A process as claimed in claim 1 wherein the cross-linking is completed by the application of radiation.

4,258,080
METHOD OF LOWERING RESISTIVITY OF METAL OXIDE SEMICONDUCTOR POWDER

Nobuo Sonoda; Wataru Shimotsuma; Yoshio Kishimoto, and Yoichi Sekine, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan5n

Filed Nov. 7, 1978, Ser. No. 958,498
Claims priority, application Japan, Nov. 8, 1977, 52/134191
Int. Cl.[3] B05D *5/12*
U.S. Cl. 427—82 7 Claims

1. A method of lowering the resistivity of an n-type metal oxide semiconductor, the metal oxide semiconductor being the oxide of a single metal element, being selected from the group consisting of tin dioxide, diindium trioxide and zinc oxide, and being in the form of a fine powder; said method comprising the step of treating the metal oxide semiconductor with an aqueous solution of a metal halide selected from the group consisting of stannous halides and antimony trihalides, in which metal halide the oxidation number of the metal is smaller than the largest oxidation number the metal can take, at a temperature below the thermal decomposition temperature of the metal halide so as to allow the metal oxide semiconductor to generally uniformly come into contact with the metal halide.

4,258,081
METHOD FOR PRODUCING LIQUID PERMEABLE DIAPHRAGMS FOR AN ELECTROLYTIC CELL

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

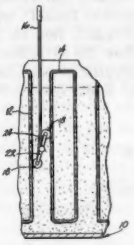
Filed Oct. 29, 1979, Ser. No. 88,796
Int. Cl.[3] C25B *1/46*
U.S. Cl. 427—121 10 Claims

1. A method for producing liquid permeable diaphragms for an electrolytic cell having a plurality of foraminous electrodes and a space between each pair of adjacent electrodes, said method which comprises:

(a) covering said foraminous electrodes with a liquid permeable thermoplastic support fabric,

(b) contacting said covered electrodes with a slurry of an electroactive material,

(c) placing roller means in said space between said pair of electrodes, said roller means comprising two rollers spaced apart, each of said rollers contacting only one of said pair of electrodes, and



(d) moving said roller means within said space between said pair of electrodes to force each electroactive material into said liquid permeable thermoplastic support fabric whereby said liquid permeable diaphragms are produced.

4,258,082
MINIMIZING EVAPORATIVE LOSSES FROM FUEL TANKS

David H. Horne, 2229 Laird Way, Salt Lake City, Utah 84108

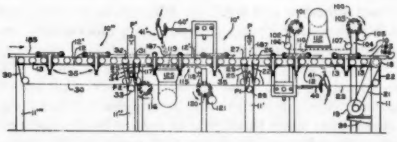
Filed Mar. 13, 1979, Ser. No. 20,067
Int. Cl.[3] B05B *5/00*
U.S. Cl. 427—160 1 Claim

1. A method for minimizing evaporative losses of liquid hydrocarbon fuels from fuel tanks installed on motor vehicles, wherein the fuel tank is positioned on the underneath portion of the body of the vehicles, said method comprising covering the surfaces of the fuel tanks which are exposed to radiation and convection from hot pavement, reflected solar radiation, and direct solar radiation with a heat insulating and radiation reflecting coating of a low heat conductivity paint having a high reflectivity, while the surfaces of the tanks which are not subject to radiation and conduction from the pavement or from reflected solar radiation are left uninsulated so as to promote as much heat dissipation as possible therefrom.

4,258,083
TREAD END CEMENTER

Ronald E. Allen, Tuscaloosa, Ala., assignor to The BF Goodrich Company, Akron, Ohio

Division of Ser. No. 854,561, Nov. 25, 1977, Pat. No. 4,173,198.
This application Mar. 28, 1979, Ser. No. 24,648
Int. Cl.[3] B05D *1/02*
U.S. Cl. 427—209 3 Claims

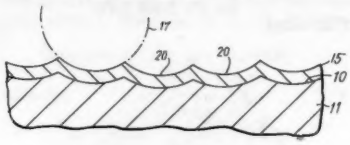


1. A method for applying cement to the respective ends of a tread slab of predetermined length comprising the steps of conveying a tread slab in a longitudinal direction with said tread slab having a forwardly disposed and rearwardly disposed tapering ends, spraying cement adhesive downwardly only onto one of said tapering ends while said tread slab is being conveyed, spraying cement adhesive upwardly onto the other one of said tapering ends while said tread slab is being conveyed, and collecting the respective oversprays from said spraying onto said tread edges.

4,258,084
METHOD OF REDUCING FUEL CONSUMPTION BY PEENING

Robert E. Hayden, Sr., Cerritos, Calif., assignor to Potters Industries, Inc., Hasbrouck Heights, N.J.

Filed Oct. 17, 1978, Ser. No. 952,055
Int. Cl.[3] B05D 7/22
U.S. Cl. 427—239 11 Claims



1. A method of reducing fuel and oil consumption in an internal combustion engine having relatively movable surfaces, the method comprising the steps of:

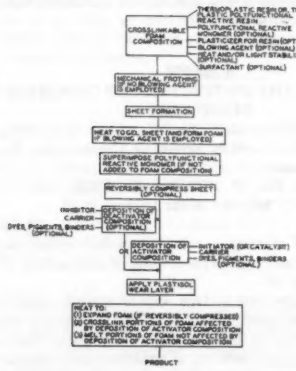
applying a lubricating agent to at least one of the relatively movable surfaces of said engine; and

propelling glass spheres toward the thus lubricated surface at a velocity sufficient to form a multiplicity of local depressions and surface compression at the points of impact but insufficient to fracture the spheres, the diameter of the glass spheres lying within the range of from about 0.002 inches to about 0.004 inches to provide depressions of similar diameter in said surface, and the spheres being directed against the surface for a period of time sufficient to saturate said surface with said depressions over the entire surface area without leaving flat portions of the surface between the depressions.

4,258,085
PROCESS OF FORMING AN EMBOSSED SURFACE COVERING

William J. Kauffman, Lancaster, and George L. Lilley, Manheim, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jan. 16, 1978, Ser. No. 869,683
The portion of the term of this patent subsequent to Apr. 15, 1997, has been disclaimed.
Int. Cl.[2] B05D 3/02, 5/00
U.S. Cl. 427—244 8 Claims


CROSS-LINKABLE FOAM COMPOSITION
THERMOPLASTIC RESIN OR THERMOPLASTIC POLYFUNCTIONAL REACTIVE RESIN
POLYFUNCTIONAL REACTIVE MONOMER (OPTIONAL)
PLASTICIZER FOR RESIN (OPTIONAL)
BLOWING AGENT (OPTIONAL)
CURATIVE AND/OR LIGHT STABILIZER (OPTIONAL)
SURFACTANT (OPTIONAL)
MECHANICAL FROTHING (IF NO BLOWING AGENT IS EMPLOYED)
SHEET FORMATION
HEAT TO GEL SHEET (AND FORM FOAM IF BLOWING AGENT IS EMPLOYED)
SUPERIMPOSE POLYFUNCTIONAL REACTIVE MONOMER (IF NOT ADDED TO FOAM COMPOSITION)
REVERSIBLY COMPRESS SHEET (OPTIONAL)
INHIBITOR
CARRIER
DYES, PIGMENTS, BINDERS (OPTIONAL)
DEPOSITION OF INHIBITOR COMPOSITION (OPTIONAL)
DEPOSITION OF OR ACTIVATOR COMPOSITION
INITIATOR (OR CATALYST)
CARRIER
DYES, PIGMENTS, BINDERS (OPTIONAL)
APPLY PLASTISOL WEAR LAYER
HEAT TO:
(1) EXPAND FOAM (IF REVERSIBLY COMPRESSED)
(2) CROSS-LINK PORTIONS OF FOAM AFFECTED BY DEPOSITION OF ACTIVATOR COMPOSITION
(3) MELT PORTIONS OF FOAM NOT AFFECTED BY DEPOSITION OF ACTIVATOR COMPOSITION
PRODUCT

1. A process of forming an embossed surface covering comprising forming a cross-linkable foam on a backing, the cross-linkable foam comprising:

(a) at least one thermoplastic resin homopolymer, copolymer, polymer blend, or polymer mixture and a polyfunctional reactive monomer which will cross-link upon contact with an activator composition or

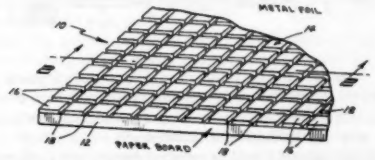
(b) at least one thermoplastic polyfunctional resin which contains sufficient functionality to cross-link upon contact with an activator composition;

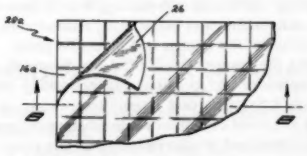
depositing an activator composition comprising an initiator and a carrier on at least a portion of the cross-linkable foam surface in an amount sufficient to initiate cross-linking in the portions of the cross-linkable foam affected by the deposition of the activator composition upon the subsequent application of heat; and heating the resulting cross-linkable foam-containing sheet to a temperature sufficient to corss-link the portions of the foam affected by the deposition of activator composition and melt the portions of the foam not affected by the deposition of activator composition, thereby producing an embossed surface having raised, cellular, cross-linked portions and lower melted portions of higher density than the raised portions.

4,258,086
METHOD OF REPRODUCTION METALLIZED PATTERNS WITH MICROWAVE ENERGY

Nelson J. Beall, St. Michael, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Continuation of Ser. No. 950,758, Oct. 12, 1978, abandoned, which is a continuation-in-part of Ser. No. 910,552, May 30, 1978, abandoned. This application Dec. 26, 1979, Ser. No. 106,956
Int. Cl.[3] C03C 15/00
U.S. Cl. 219—10.43 16 Claims





1. A method of reproducing a pattern formed on the metallized surface of a first dielectric substrate on the metallized surface of a second dielectric substrate comprising the steps of placing said metallized surfaces in a proximal relation, and subjecting said surfaces to microwave energy for a time sufficient to remove metal from the metallized surface of said second substrate in accordance with the pattern formed on the metallized surface of said first substrate.

4,258,087

DISPERSIONS FOR ACTIVATING NON-CONDUCTORS FOR ELECTROLESS PLATING

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540, assignor to Nathan Feldstein and Surface Technology, both of Princeton, N.J.

Division of Ser. No. 934,344, Aug. 17, 1978, which is a division of Ser. No. 830,456, Sep. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 731,212, Oct. 12, 1976, Pat. No. 4,136,216, which is a division of Ser. No. 607,506, Aug. 26, 1975, Pat. No. 3,993,799, which is a continuation-in-part of Ser. No. 512,224, Oct. 4, 1974, abandoned. This application Jul. 5, 1979, Ser. No. 55,153

Int. Cl.[3] C23C *3/02*

U.S. Cl. 427—305 17 Claims

1. A process for the preparation of non-conductor substrate prior to electroless or chemical metal deposition comprising immersing said non-conductor substrate into a stable colloidal dispersion of at least one catalytic metal formed by the reaction of a compound of said catalytic metal with a precipitating agent and the detrimental by-product formed by said reaction is removed or inactivated from said dispersion and further wherein said detrimental by-product is detrimental to the final deposition results.

4,258,088

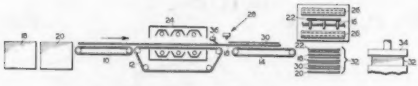
METHOD FOR THE UNIFORM APPLICATION OF FOAMED LIQUID MIXTURES TO SUBSTRATES

Charles N. Cone, 10100 SW. Highland Dr., Tigard, Oreg. 97223, and Julius M. Steinberg, Rte. 1, Box 19, Forest Grove, Oreg. 97116

Continuation-in-part of Ser. No. 615,130, Sep. 22, 1975, abandoned, which is a division of Ser. No. 346,630, Mar. 3, 1973, Pat. No. 3,905,329. This application May 2, 1977, Ser. No. 792,977

Int. Cl.[3] B05D *3/02*

U.S. Cl. 427—316 11 Claims



1. A method for the uniform application of a foamed viscous liquid to an intermittently-moving substrate which comprises:

(a) subjecting the raw liquid to a mechanical beating action whereby its density is reduced;

(b) passing said liquid of reduced density to a feed reservoir;

(c) withdrawing liquid from said feed reservoir and passing said liquid to a foamer;

(d) foaming said liquid and passing it to a diversion point while maintaining a constant and predetermined pressure drop between the foamer and diversion point;

(e) passing the foamed liquid from the diversion point to a foam spreader and continuously depositing the foamed liquid as a foam on said intermittently-moving substrate during its period of motion while substantially maintaining said constant and predetermined pressure drop;

(f) diverting the foamed liquid from the diversion point during those periods wherein said intermittently moving substrate is at rest;

(g) subjecting said diverted foamed liquid to a mechanical beating action operable to increase its density to substantially that of said liquid of reduced density while substantially maintaining said constant and predetermined pressure drop, and

(h) passing the mechanically beaten liquid to said feed reservoir.

4,258,089

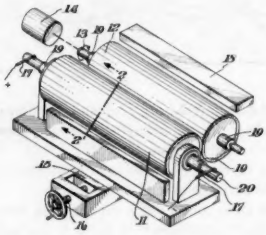
PRODUCTION OF FUSED THERMOPLASTIC FLUOROCARBON POLYMER COVERINGS ON CYLINDERS

Edward P. Anderson, Gaunt Dr., Mickleton, N.J. 08056, and Donald G. Curran, 233 Amosland Rd., Norwood, Pa. 19074

Continuation of Ser. No. 869,827, Jan. 16, 1978, which is a continuation of Ser. No. 669,820, Mar. 24, 1976, abandoned. This application Feb. 7, 1979, Ser. No. 10,067

Int. Cl.[3] B30B *3/00*

U.S. Cl. 427—318 12 Claims



1. A process for producing a thermally conductive, metallic cylindrical substrate having bonded to its surface as a covering a thermoplastic fluorocarbon polymer the outer surface of which is smooth and contains a low amount of voids which process comprises

heating a metallic substrate sufficiently so that the temperature of its outer surface which consists only of exposed metal is about that of the softening point of said polymer;

placing said polymer having a softening point into direct contact with said exposed metal; and

exerting, from a source external to the resultant combination of substrate and polymer, direct pressure on said polymer by means of a rotating elastomeric opposing pressure roll at about said temperature to force said polymer into direct bonding contact with said metal and simultaneously forming the outside surface of said polymer into a smooth, continuous polymeric surface, said process being effected in the absence of bonding agents such as adhesives or etchants, thereby forming in combination with said cylinder a tight, heat-stable bond as characterized by a peel strength of at least 2.5 lbs. per inch which strength has a long-life at temperatures around the maximum working temperature of the polymer.

4,258,090

METHOD FOR THE PROTECTION OF CONCRETE IN SEA WATER

Dino S. Moraru, Bucharest, Romania, assignor to Institutul de Cergetari in Constructii si Economia Constructiilor Incerc, Bucharest, Romania

Filed Jan. 19, 1979, Ser. No. 5,038

Int. Cl.[3] B05D *3/02*

U.S. Cl. 427—386 11 Claims

1. A method of treating a concrete surface to be used in contact with sea water to prevent fouling of said surface which comprises the steps of:

(a) fluating the concrete surface with an aqueous solution of a compound selected from the group consisting of fluorosilicic acid calcium fluorosilicate, magnesium fluorosilicate, and zinc fluorosilicate of sufficient concentration to strengthen the concrete surface and to prevent biodeterioration thereof;

(b) treating the concrete surface with a biocide insoluble in water and selected from the group consisting of copper naphthenate, beta-naphthol, pentachlorophenol and tributyl tin oxide to prevent biodeterioration of the concrete surface; and

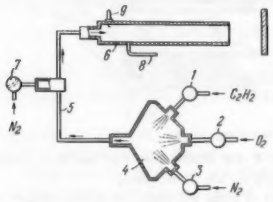
(c) fixing the concrete surface treated during steps (a) and (b) by treating the surface with the biocide defined in step (b) in solution with a polyesteric resin or an epoxy resin.

4,258,091

METHOD FOR COATING

Daniil A. Dudko, ulitsa Anri Barbjusa, 22/26; Anatoly I. Zverev, ulitsa Bratislavskaya, 26, kv. 22; Evgeny A. Astakhov, ulitsa Vyborgskaya, 89-a kv. 46, all of Kiev, and Georgy G. Pulyaevsky, ulitsa B. Bronnaya, 26, kv. 23, Moscow, all of U.S.S.R.

Filed Feb. 6, 1979, Ser. No. 9,947
Int. Cl.³ B05D *1/08*
U.S. Cl. 427—422 **1 Claim**



1. A method of applying a powdered coating material to a substrate utilizing the explosive energy of combustion gases for ejecting the powdered material towards the substrate in a current cyclic operation comprising:

(a) continuously and constantly supplying to a mixing chamber a combustible gas and an oxidizing gas in a predetermined ratio during the coating process, thereby forming an explosive mixture.

(b) introducing portion-wise the powdered material, in a stream of an inert gas and said explosive mixture, freely into a combustion chamber of an apparatus for coating by detonation waves, the introduction of said coating material being synchronized with the operation cycle of said apparatus for coating;

(c) terminating the supply of explosive mixture to the combustion chamber solely by intorduction of an inert gas intermediate the mixing chamber and the combustion chamber at a pressure greater than that of the explosive mixture, thus preventing the flow of explosive mixture into the combustion chamber;

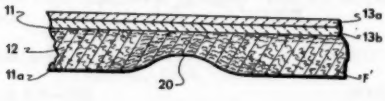
(d) igniting said explosive mixture in the combustion chamber to produce an explosion after a portion of the powdered material has been introduced completely into the combustion chamber.

4,258,092

LAMINATE WITH REMOVABLE SCORED PAPER BACKING

Jacques E. Labar, Braine Le Comte, Belgium, assignor to Morgan Adhesives Co., Stow, Ohio

Filed Aug. 31, 1978, Ser. No. 938,367
Int. Cl.³ B32B *3/30*
U.S. Cl. 428—40 **6 Claims**



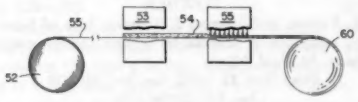
1. A laminate for use in making a label or the like and comprising a face sheet, a layer of pressure sensitive adhesive in contact with one surface of said face sheet, a fibrous paper backing layer, and a release layer between one face of said paper backing layer and one surface of said adhesive layer and where said lamainate is characterized by said paper layer having a clay containing coating on its said one face and having appreciably compacted score lines formed in its second and porous outer face, said one face of said paper backing layer having a machine glazed surface, said clay containing coating being relatively uniform and non-porous, said paper backing layer having a BEKK smoothness on its said coated one face of a minimum of about 360 and having a maximum BEKK smoothness on its uncoated face of about 30, said paper backing layer being uncompressed, and said paper backing layer of a given weight having more bulk per unit of basic weight than a super calendered paper of the same basic weight.

4,258,093

MOLDING NONWOVEN, NEEDLE PUNCHED FABRICS INTO THREE DIMENSIONAL SHAPES

Joseph C. Benedyk, Highland Park, Ill., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 26, 1979, Ser. No. 33,460
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—85 **29 Claims**



1. A method for making a three dimensional fabric shape having sufficient rigidity to maintain that shape which comprises:

forming a nonwoven, needlepunched fabric containing at least 5% by weight of fibers of ethylene-vinyl acetate in admixture with fibers of a higher melting polymer, said ethylene-vinyl acetate fibers having an elastic modulus in excess of 5,000 psi;

heating the fabric to a temperature above the softening point of said ethylene-vinyl acetate fibers but below the temperature at which the fibers of said higher melting point polymer begin to soften and melt;

pressing said heated fabric between the faces of a complementary mold pair, and

allowing the shaped fabric to cool to a temperature below the softening point of said ethylene-vinyl acetate before removing it from the mold.

17. A three dimensional shaped fabric having sufficient rigidity to maintain that shape comprising a blend of fused ethylene-vinyl acetate fibers with unfused fibers of a higher melting point polymer, said ethylene-vinyl acetate fibers having an elastic modulus in the range of about 5,000 to 60,000 psi and being needled into the back of a nonwoven, needlepunched, scrimless fabric of said higher melting point fibers.

4,258,094

MELT BONDED FABRICS AND A METHOD FOR THEIR PRODUCTION

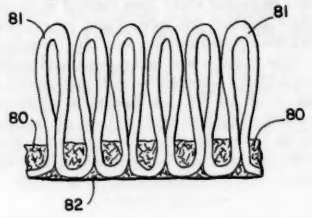
Joseph C. Benedyk, Highland Park, Ill., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 26, 1979, Ser. No. 33,462
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—85 **34 Claims**

1. A method for making a melt bonded fabric which comprises blending ethylene-vinyl acetate fibers with fibers of a higher melting point polymer in a mat upon a scrim, needle punching said mat and scrim to form a web of said blended fibers and thereafter heating the web to a temperature above the melting point of ethylene-vinyl acetate but below the melting point of said higher melting point polymer.

25. A melt bonded fabric comprising a blend of fused ethy-

lene-vinyl acetate fibers with unfused fibers of a higher melting point polymer, said ethylene-vinyl acetate fibers having an



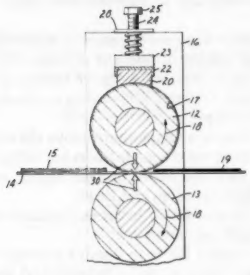
elastic modulus in the range of 5,000 to 60,000 psi, said fabric having a surface comprised of said blend and being tufted with yarn to form a fabric face.

4,258,095

REDUCED GLOSS IN PRESSURE-FIXING OF TONER POWDER

Roger L. Larson, and Morgan J. Tamsky, both of Saint Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 13, 1978, Ser. No. 960,035
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—172 **7 Claims**



1. A photo copying apparatus including means for pressure fixing imaging powder to a receptor so as to produce photocopies having reduced gloss, said apparatus comprising:

(a) two non-compliant pressure members, one of said members having a textured surface that has a surface roughness in the range of about 0.2 to 1.2 micrometers;

(b) means for maintaining said pressure members so as to fix imaging powder to a receptor passing therebetween, said textured pressure member engaging said receptor on the surface of said receptor having imaging powder thereon;

(c) an imaging powder offset preventing material coated on said textured pressure member in sufficient amount to essentially prevent offset of said imaging powder from said receptor to said textured surface, said imaging powder offset preventing material being selected from (i) Newtonian liquids having a surface tension of less than about 40 to 45 mN/m as measured using the DuNouy ring technique and a viscosity of greater than about 4 to 10 centipoise, (ii) non-Newtonian liquids having a surface tension of less than about 40 to 45 mN/m and a shear modulus at the shear rate of copying of less than about 10^6 dyne/cm^2, and (iii) mesomorphic, powderphobic solids;

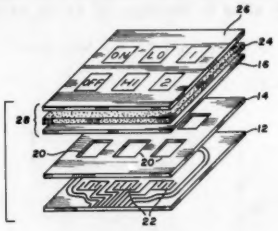
(d) means for applying said offset prevention material to said textured surface.

4,258,096

COMPOSITE TOP MEMBRANE FOR FLAT PANEL SWITCH ARRAYS

Frederick W. LaMarche, Northfield, Minn., assignor to Sheldahl, Inc., Northfield, Minn.

Filed Nov. 9, 1978, Ser. No. 959,238
Int. Cl.³ B32B *3/10, 5/18, 7/04*
U.S. Cl. 428—209 **8 Claims**



8. A composite top membrane for use in flat panel membrane-type switch arrays comprising:

(a) a first sheet of clear polyester material having a thickness of 0.007 inches and having graphic indicia on one side surface thereof;

(b) a double adhesive coated continuous layer of polyurethane foam material having a generally constant thickness in the range of from 0.030 inches to 0.125 inches and a density in the range of from 5 to 20 durometer, said one side of said sheet of clear polyester abutting and adhesively secured to one side of said layer of polyurethane foam; and

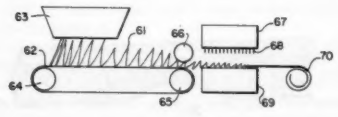
(c) a second sheet of polyester film material having a thickness in the range of from 0.003 inches to 0.005 inches with one side thereof abutting and adhesively secured to the other side of said layer of foam and the other side of said sheet of polyester film having a pattern of electrical conductors thereon, the arrangement being such that said composite top membrane is substantially free of convolutions.

4,258,097

NON-WOVEN LOW MODULUS FIBER FABRICS

Joseph C. Benedyk, Highland Park, Ill., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 26, 1979, Ser. No. 33,480
The portion of the term of this patent subsequent to Jan. 1, 1997, has been disclaimed.
Int. Cl.³ D02G *3/00;* **D04H** *1/00*
U.S. Cl. 428—224 **34 Claims**



1. A non-woven, needle punched fabric comprising staple length, polymeric monofilament fibers, said fibers having an elastic modulus in the range of 5,000 to 60,000 psi, an area moment of inertia of from 400×10^{-14} to $7{,}000\times10^{-14}$ in^4 and a stiffness parameter of from 1×10^{-5} to 1×10^{-8} lb-in^2.

4,258,098

GLASS FIBER MAT WITH IMPROVED BINDER

Alfredo A. Bondoc, Middlesex, N.J., and Philip A. Cautilli, Feasterville, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Jun. 6, 1979, Ser. No. 45,934
Int. Cl.[3] D04H *1/58;* B32B *27/00;* D04H *1/64;* D21H *3/52*
U.S. Cl. 428—288 12 Claims

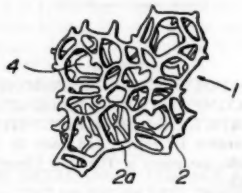
1. A glass fiber mat having excellent tensile strength and flexibility properties consisting essentially of a plurality of glass fibers and a binder to hold said fibers together, characterized in that said binder comprises about 25% to 90% by weight of urea-formaldehyde resin and about 10% to 75% by weight of a styrene-butadiene latex compolymer containing about 0.1% to 5% by weight of acrylamide, methacrylamide, N-methylolacrylamide, or N-methylolmethacrylamide, or mixtures thereof.

4,258,099

CORDIERITE, ALUMINA, SILICA POROUS CERAMIC BODIES COATED WITH AN ACTIVATED ALUMINA LAYER

Tsuneaki Narumiya, Yokohama, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 22, 1979, Ser. No. 87,183
Claims priority, application Japan, Oct. 21, 1978, 53-129785
Int. Cl.[3] B32B *5/18, 3/26*
U.S. Cl. 428—311 3 Claims



1. A ceramic porous body useful as a filtering material for molten metal and having a three-dimensional network cellular structure with a plurality of interconnected voids without clogging in any direction, characterized in that said ceramic porous body is formed by covering surfaces of cell strands of a ceramic porous body skeleton, consisting essentially of cordierite, alumina, and silica, having a bulk specific gravity of 0.25–0.55 with 3–40% by weight per the weight of the skeleton of an activated alumina layer and having an average diameter of said interconnected voids of 0.3–5.0 mm, a pressure loss of 0.3–30.0 mm as a water-gauge pressure when passing air through the body of 1 cm thick at a rate of 1 m/sec., a microsurface area of not less than 10 m^2/g, and a porosity of 75–95%.

4,258,100

PRESSURE-SENSITIVE ELECTRIC CONDUCTIVE SHEET MATERIAL

Takeo Fujitani, Osaka, and Kajio Matsuoka, Tondabayashi, both of Japan, assignors to Kabushiki Kaisha Kyowa, Osaka, Japan

Filed Sep. 6, 1978, Ser. No. 940,058
Claims priority, application Japan, Sep. 9, 1977, 52-122132[U]
Int. Cl.[3] B32B *5/18, 5/22*
U.S. Cl. 428—315 14 Claims

1. A pressure-sensitive electric conductive sheet material comprising at least one layer of rubbery elastic material and an adhesive layer disposed on at least one of the surfaces of said sheet, both layers having substantially uniformly distributed fine particles of electric conductive metal, the quantity and size of said metal particles being such that the electrical conductivity of said sheet is sensitive to pressure.

2. A pressure-sensitive electric conductive sheet material according to claim 1, wherein said layer of rubbery elastic material is foamed.

4,258,101

CONDUCTIVE PLASTIC WITH METALIZED GLASS FIBERS RETAINED IN PARTIAL CLUMPS

Edward G. Crosby, Marlboro, and Frederick C. Hornbeck, Wappingers Falls, both of N.Y., assignors to Internation Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 795,351, May 9, 1977, abandoned. This application Aug. 4, 1978, Ser. No. 931,064
Claims priority, application Sweden, Mar. 30, 1978, 7803576
Int. Cl.[3] B32B *5/02*
U.S. Cl. 428—371 8 Claims

1. A thermo plastic molding pellet for molding articles of plastic and metalized glass fibers by a process in which the fibers disperse through a molded article but tend to become aligned in the general direction of the flow of plastic into a mold and contact between adjacent fibers for electrical conductivity is thereby reduced, comprising,

a core of metalized glass fibers and an outer body of a thermoplastic,

wherein the metalized glass fibers in the core of a pellet are arranged to partially disperse in the molded article as individual fibers and partially to remain as clumps having a thickness that is appreciably greater than the thickness of an individual fiber for improving the fiber to fiber contact in the direction orthogonal to the general direction of plastic flow in a subsequently molded plastic article.

4,258,102

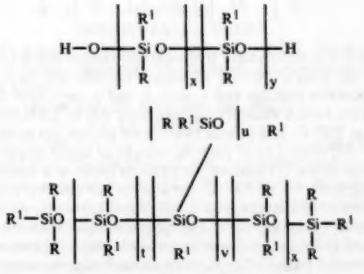
SILICONE COMPOSITIONS FOR TREATING GYPSUM BOARD

Frank J. Traver, Troy, and William J. Raleigh, Watervliet, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jul. 16, 1979, Ser. No. 58,042
Int. Cl.[3] B32B *5/16, 13/08*
U.S. Cl. 428—331 28 Claims

1. Gypsum paper that is treated with an emulsified silicone composition to make it water repellent wherein said composition comprises;

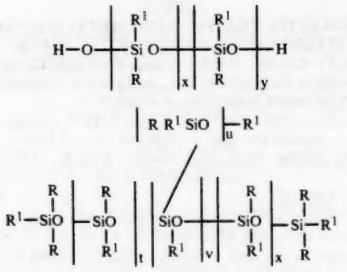
(a) 100 parts by weight of polysiloxane selected from the class consisting of the formula,



where R is a monovalent hydrocarbon radical and R^1 selected from the class consisting of silanol radicals and monovalent hydrocarbon radicals and x, u, v, y and t vary such that the polymers have a viscosity varying from 500 to 1,000,000 centipoise at 25° C. and at least two silanol groups per molecule;

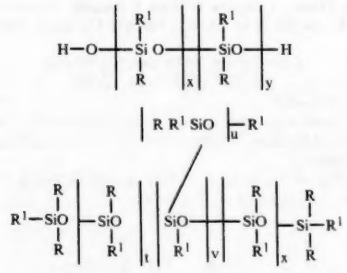
(b) from 1 to 25 parts by weight of liquid suspension of colloidal silica.

13. A process for treating gypsum paper with an emulsified silicone composition to make it water repellent comprising; (1) applying to the gypsum paper a composition comprising (a) 100 parts by weight of a polysiloxane selected from the class of polysiloxanes of the formula,



where R is monovalent hydrocarbon radical and R^1 is selected from the class consisting of silanol radicals and monovalent hydrocarbon radicals and x, u, v, t, and y vary such that the polymers have a viscosity varying from 500 to 1,000,000 centipoise at 25° C.; (b) from 1 to 25 parts by weight of a liquid suspension of colloidal silica; (2) heating the resulting composition to a temperature in the range of 75° to 500° C. for a period of time varying from 1 second to 10 minutes, so as to cure the composition on the paper.

28. A process for forming gypsum board comprising (1) treating one side of an emulsified silicone gypsum paper so as to make it water repellent with a composition comprising; 100 parts by weight of a polysiloxane selected from the class consisting of the formula;



where R is a monovalent hydrocarbon radical and R^1 selected from the class consisting of silanol radicals and monovalent hydrocarbon radicals and x, u, v, t, and y vary such that the polymers have a viscosity varying form 800 to 1,000,000 centipoise at 250° C. and at least two silanol groups per molecule at 25° C.; (b) from 1 to 25 parts by weight of liquid suspension of colloidal silica; (2) heating the gypsum paper at a temperature varying from 75° to 500° C. for a period of time varying from 1 second to 10 minutes so as to cure the silicone composition on the paper; (3) taking the coated gypsum paper with the coated side and utilizing it to form a sandwich with Gypsum mixture between the pieces of gypsum paper such that the water repellent silicone coated side of the gypsum paper is next or adjacent to the gypsum mixture to form a composite and (4) curing the composite to form gypsum board.

4,258,103

DECORATIVE LAMINATE COMPRISING AN INHERENTLY GLUABLE BACKING SHEET AND PROCESSES FOR MAKING SAME

William A. Hosmer, Cape Elizabeth, and William M. Bowler, Portland, both of Me., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Jul. 30, 1975, Ser. No. 600,225
Int. Cl.³ B32B *27/20*
U.S. Cl. 428—342 **34 Claims**

1. A decorative, heat-and-pressure consolidated laminate which comprises at least a decorative sheet impregnated with a thermosetting resin which does not undergo any significant color deterioration during consolidation and a backing sheet, the outer surface of which has been coated prior to consolidation with a coating composition which comprises an inert filler, a non-thermoplastic adhesive, and a water-soluble, thermosetting resin selected from the class consisting of urea-formaldehyde resin condensates and melamine-formaldehyde resin condensates.

4,258,104

AQUEOUS POLYMERIC DISPERSIONS, PAPER COATING COMPOSITIONS AND COATED PAPER ARTICLES MADE THEREWITH

Do I. Lee; Lawrence D. Harry, and Jack D. Morris, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 27, 1979, Ser. No. 34,061
Int. Cl.³ B32B *23/08, 27/10;* **B05D** *3/02*
U.S. Cl. 428—342 **27 Claims**

1. An aqueous polymer dispersion containing:

(a) from about 10 to about 60 weight percent based upon the total dispersion weight of an alkali insoluble polymer having a glass transition temperature equal to or less than about 50° C. and

(b) from about 0.5 to about 25 weight percent based upon the alkali insoluble polymer of an alkali soluble synthetic addition polymer comprising, in polymerized form and based upon the weight of such alkali soluble polymer,

(1) from about 40 to about 90 percent of a vinyl ester of a non-addition polymerizable carboxylic acid;

(2) from about 5 to about 55 percent of a nitrile, a C_2 to about C_4 hydroxyalkyl ester or a C_1 to about C_8 alkyl ester of a monoethylenically unsaturated carboxylic acid; and

(3) from about 5 to about 15 percent of a monoethylenically unsaturated carboxylic acid.

12. An aqueous coating composition comprising a pigment and the aqueous polymeric dispersion of claim **1** as a binder.

13. The aqueous coating composition of claim **12** wherein the amount of the polymer solids of the aqueous polymeric dispersion is from about 3 to about 30 parts by weight per 100 parts by weight of the pigment, all parts being on a dry basis.

14. A coated paper product comprising a paper sheet carrying a dried deposit of the coating composition of claim **13**.

16. The coated paper product of claim **14** wherein the amount of the dried coating composition on each coated surface of the paper sheet is from about 3 to about 30 grams per square meter on a dry basis and based upon the surface area of such coated surface.

4,258,105
SEALANT COMPOSITIONS CONTAINING THIOL-TERMINATED POLYESTERS

Ralph P. Williams, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 30, 1979, Ser. No. 43,763
Int. Cl.³ C08L 67/00
U.S. Cl. 428—431 **18 Claims**

1. Curable sealing and coating compositions comprising

(a) a mercaptan-terminated polyether-polyester polymer having an average of more than two mercapto groups per molecule prepared by reacting a poly(oxyalkylene) polyol with a mixture of at least one mercaptoalkanoic acid and at least one thiodialkanoic acid or with a mixture of at least one alkyl mercaptocarboxylate and at least one dialkyl thiodicarboxylate;

(b) at least one non-lead metal oxide curing agent selected from the group consisting of metal oxides within Groups II and VII of the Periodic Table, and

(c) at least one organonitrogen rubber vulcanization accelerator selected from the group consisting of

(1) compounds derived from an aldehyde and an amine

(2) organonitrogen compounds having sulfur represented by the formula

$$[R—(S)_a]_b[(S)_c]_d[M]_d$$

wherein R contains at least 1 nitrogen atom, 1 sulfur atom, and 3 carbon atoms arranged in a linear, branched, or cyclic configuration, M is a metal, a is 0 to 3, b is 2, 3 or 4, c is 0 or 1 and d is 0 or 1, and

(3) compounds having nitrogen, sulfur, oxygen, carbon and hydrogen atoms which can exist in one molecular or a combination of molecules.

the amount of (b) and (c) present being sufficient to effect cure under ambient conditions.

4,258,106
METHOD OF OBTAINING INTERFACE ADHESION AND ARTICLES PRODUCED THEREBY

Walter D. Cottrell, Jr., Newark, and Ralph B. Jutte, Jr., Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 710,979, Aug. 2, 1976, Pat. No. 4,144,305, which is a continuation of Ser. No. 558,405, Mar. 14, 1975, abandoned. This application Mar. 9, 1979, Ser. No. 19,209
Int. Cl.³ B32B 27/06, 27/36
U.S. Cl. 428—482 **9 Claims**

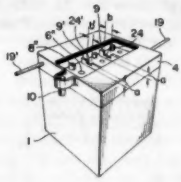
1. A composite comprising: first and second layers of thermoset materials crosslinked by in situ reacted monomer, with at least said first layer containing a mold release agent, and a sheet of thermoplastic material containing in situ polymerized monomer and mold release agent absorbed from said layers of thermoset materials sandwiched between and bonded to said first and second layers of thermoset material.

4,258,107
STORAGE BATTERY WITH VENT AND FILLING CONTROL MEANS IN COVER

Yoshichika Nakagawa, Takatsuki, Japan, assignor to Yuasa Battery Company Limited, Takatsuki, Japan

Filed Oct. 10, 1979, Ser. No. 83,272
Claims priority, application Japan, Oct. 19, 1978, 53/129148; Jun. 29, 1979, 54/90503[U]
Int. Cl.³ H01M 2/36
U.S. Cl. 429—78 **6 Claims**

1. A storage battery comprising an electrolyte filled part common to respective cells and provided in a cover covering the battery container, and including venting and electrolyte pouring holes provided in the bottom thereof for the respective cells, electrolyte level defining tubes projecting upwardly from said bottom within said electrolyte filled part and downwardly substantially to define a defined electrolyte level for the respective cells, dividing walls dividing said electrolyte filled part into cell units and including a portion lower than the upper ends of said electrolyte level defining tubes, an exhaust port provided at one end of said electrolyte filled part and

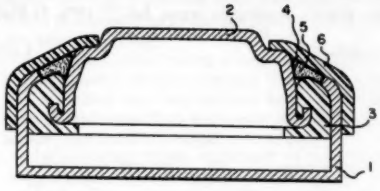


common to the respective cells, an electrolyte pouring port provided in the upper part of said electrolyte filled part and common to the respective cells, and an electrolyte port plug closing said electrolyte pouring port.

4,258,108
LEAK-PROOFING OF BUTTON CELLS

Helmut Glaser, Singapore, Singapore, assignor to Varta Batterie, A.G., Am Leineufer, Fed. Rep. of Germany

Filed Apr. 14, 1980, Ser. No. 139,744
Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919716
Int. Cl.³ H01M 2/08
U.S. Cl. 429—162 **10 Claims**



1. A galvanic element, particularly a button cell, having an alkaline electrolyte in a metal housing which is sealed in gastight manner by means of a synthetic plastic seal between the housing cup and the lid and comprising

a hydroxide binding material positioned on the side of the sealing region facing away from the electrolyte.

4,258,109
SOLID STATE CELLS

Charles C. Liang, Andover, and Ashok V. Joshi, Burlington, both of Mass., assignors to Duracell International Inc., Bethel, Conn.

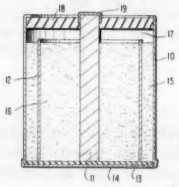
Filed Apr. 25, 1977, Ser. No. 790,724
Int. Cl.³ H01M 10/36
U.S. Cl. 429—191 **10 Claims**

1. A solid state electrochemical cell comprising a solid active metal anode, a solid electrolyte and a solid cathode wherein said cathode consists of at least 90% cathode active materials and wherein said cathode consists essentially of a cathode active material having room temperature ionic and electronic conductivities ranging between 10^{-10} to 10^{2} ohm^{-1} cm^{-1} and a cathode active non-conductive chalcogenide.

4,258,110
ELECTROLYTIC DEVICE

Mario Y. Alvarez, and Oscar Mejia, both of Avenida 39 No. 14-92, Bogota, Colombia

Continuation-in-part of Ser. No. 446,900, Feb. 28, 1974, abandoned. This application Feb. 11, 1976, Ser. No. 657,293
Claims priority, application Colombia, Nov. 9, 1973, 142075
Int. Cl.³ H01M *6/06*
U.S. Cl. 429—188 **19 Claims**

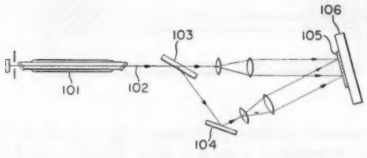


1. An electrolytic device comprising at least two electrodes spaced from one another and an electrolyte positioned between said two electrodes, said electrolyte consisting essentially of paste of material of the fruit of the *Carica papaya*.

4,258,111
HOLOGRAM AND METHOD OF PRODUCTION THEREOF WITH PHOTO-CROSSLINKABLE POLYMERS

Masakazu Matsumoto, and Katsuhiko Nishide, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 819,584, Jul. 27, 1977, Pat. No. 4,172,724. This application May 29, 1979, Ser. No. 43,243
Claims priority, application Japan, Jul. 27, 1976, 51-89488
Int. Cl.³ G03C *5/04*
U.S. Cl. 430—2 **4 Claims**



1. A relatively thin volume type phase hologram produced by exposing a recording carrier to an interference pattern of radiant rays, said recording carrier consisting essentially of
(1) a polymer containing in its unit structure an aromatic or heterocyclic ring having therein a reactive position capable of being substituted by a radical, and;
(2) a halogenic radical former wherein said polymer and said halogenic radical former are cross-linked responsive to said interference pattern.

4,258,112
SENSITIZER FOR ELECTROPHORETIC MIGRATION IMAGING DISPERSIONS

Joseph Y. Kaukeinen, and Hal E. Wright, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

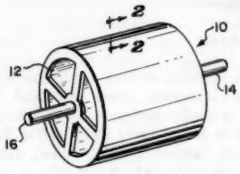
Filed Oct. 23, 1978, Ser. No. 953,733
Int. Cl.³ G03G *17/04*
U.S. Cl. 430—34 **9 Claims**

1. An electrophoretic migration imaging dispersion comprising an electrically insulating carrier, an electron accepting electrically photosensitive pigment, and a sensitizing amount of one or more compounds selected from the group consisting of (a) aromatic amines having a p-alkyl, p-alkoxy or p-alkoxycarbonyl substituent on the aromatic group, (b) aryl alkanes, isoalkanes and cycloalkanes having at least two aryl groups with at least one aryl group having an amino substituent, (c) dialkylarylamines having a pyranylalkenyl, a quinolinylalkenyl or an arylazo substituent on the aryl group, (d) a julolidine and (e) a isobenzofuran.

4,258,113
ENDLESS BELT OR CYLINDER FOR USE WITH ELECTROSTATIC IMAGING AND METHOD OF MAKING THE SAME

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Dec. 27, 1977, Ser. No. 864,376
The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.
Int. Cl.³ G03G *5/04*; C23C *15/00*
U.S. Cl. 430—94 **13 Claims**



1. An endless sleeve for electrostatic imaging and comprising a substrate of conductive material arranged for mounting in an imaging apparatus and having a photoconductive coating that has a thickness of the order of a micron and is at least about 2000 Angstroms thick, the coating being sputtered, microcrystalline, electrically anistropic, has a dark resistivity of at least 10^{12} and a ratio of light to dark resistivity of at least 10^4, is a durable, wholly inorganic photoconductive material that is capable of being charged, exposed and developed.

4,258,114
ELECTROPHOTOGRAPHIC RECORDING MATERIAL AND METHOD OF MANUFACTURING SAME

Rolf Clasen, and Hans G. Junginger, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 20, 1979, Ser. No. 31,896
Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2820302
Int. Cl.³ G03G *5/04*
U.S. Cl. 430—67 **15 Claims**

1. An electrophotographic recording material comprising:
a layer of electrically conductive material;
a dielectric foil;
a porous layer comprising a photoconductive material in a binder, disposed between the layer of conductive material and the foil;
a high-ohmic dielectric liquid which wets both the porous layer and the foil and which fills the pores of the porous layer.

4,258,115
WET DEVELOPING METHOD USING ELASTIC ROLLER FOR ELECTROSTATIC IMAGE AND A DEVICE THEREFOR

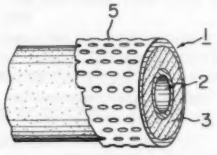
Tamotsu Magome, Kawasaki, and Takashi Saito, Ichikawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1979, Ser. No. 16,277

Claims priority, application Japan, Mar. 7, 1978, 53-25613; Mar. 8, 1978, 53-26182; Apr. 13, 1978, 53-43506

Int. Cl.³ G03G *13/10, 15/10*

U.S. Cl. 430—125 **22 Claims**



1. A method of developing an electrostatic image by supplying developing liquid to an electrostatic image bearing surface, said method comprising a first step of bringing said developing liquid into contact with said bearing surface to effect development of the electrostatic image, and a second step of urging an elastic member having an endless outer surface and which squeezes out and absorbs liquid in accordance with its elastic deformation against said bearing surface after said first step to effect supply of said developing liquid and absorption of excess developing liquid by said member and thereby effect further development of said electrostatic image.

6. A device for wet-developing an electrostatic image comprising a developing member for supplying developing liquid to an electrostatic image formed on an electrostatic image bearing member by being urged against said bearing member as the means for developing said electrostatic image with developing liquid and for collecting excess developing liquid, and a liquid pool forming member disposed in proximity to said developing member and said bearing member for forming a pool of developing liquid.

4,258,116
PROCESS FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

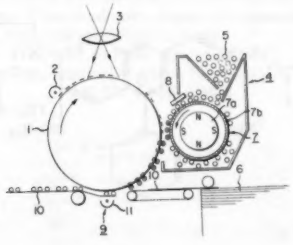
Yoshio Takasu, Toride, and Takashi Hino, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1978, Ser. No. 968,205

Claims priority, application Japan, Dec. 22, 1977, 52/154630

Int. Cl.³ G03G *13/08*

U.S. Cl. 430—102 **11 Claims**



1. In a process for developing electrostatic images comprising:

(1) generating an electrostatic latent image of a first polarity on an electrostatic latent image bearing surface; (ii) providing a developer carrying member having an outer surface in a spaced apart opposed relation to said image bearing surface; (iii) introducing on the surface of said developer carrying member a particulate developer the improvement comprising:

(a) providing a particulate developer containing an organic semi-conductor, said semi-conductor available on the outer surface of said developer, said developer adapted to be insulating at a normal state and charged under the influence of an electric field, and

(b) providing a surface for said developer carrying member formed from a material which has a negative contact potential with respect to gold, and

(c) developing said latent image by positioning the surface of said developer carrying member bearing said particulate developer in said opposed relation to said image bearing surface, whereby an electric field forms between the electrostatic latent image bearing surface and the developer carrying member, said field inducing both the injection of electric charges in the developer of opposite polarity to the electrostatic latent image and the resulting attraction of said charged developer to said latent image bearing surface.

4,258,117
DYE IMAGE REVERSAL PROCESSES AND IMAGE TRANSFER FILM UNITS

John Morgan, Ruislip, and Peter D. Marsden, North Harrow, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 1, 1979, Ser. No. 90,230

Claims priority, application United Kingdom, Feb. 9, 1979, 4691/79

Int. Cl.³ G03C *1/40, 7/00, 5/54, 1/76*

U.S. Cl. 430—214 **20 Claims**

18. In an image transfer film unit capable of producing a transferred dye image when imagewise exposed and photographically processed with an alkaline processing composition, said film unit comprising

a photographic element having a support, a negative-working silver halide emulsion imaging layer on said support and, associated with said emulsion layer, an initially immobile negative-working dye image providing compound capable of providing a mobile dye image,

an image-receiving means positioned to receive mobile image dye from said photographic element and

an electron transfer agent located to develop silver halide and thereby produce oxidized electron transfer agent during processing,

the improvement comprising

a competing oxidizable substance which is capable of being preferentially cross-oxidized by oxidized electron transfer agent to prevent oxidation of the dye image providing compound, the competing oxidizable substance being located to contact the oxidized electron transfer agent and being present in an amount sufficient to regenerate substantially all of the electron transfer agent oxidized by development of imagewise exposed silver halide,

a layer containing additional silver halide which, when fogged, develops at a faster rate than silver halide present in said silver halide emulsion imaging layer, said additional silver halide being present in an amount sufficient to permit oxidized electron transfer agent produced by development of said additional silver halide to deplete by cross-oxidation said competing oxidizable substance and

a processing composition permeable layer containing an oxidized electron transfer agent scavenger separating said additional silver halide from said immobile dye image providing compound, so that mobile image dye is produced selectively by development of imagewise unexposed silver halide in said silver halide emulsion imaging layer following depletion of said competing

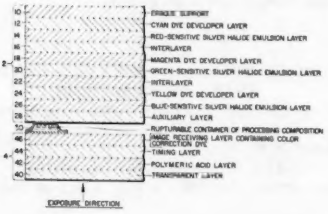
oxidizable substance to produce a positive transferred dye image in said image-receiving means.

4,258,118

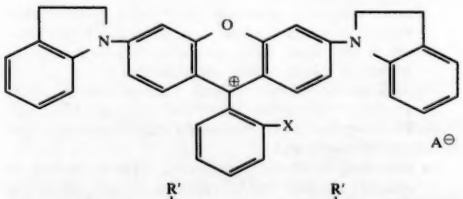
NOVEL XANTHENE COMPOUNDS AND PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING THE SAME

James W. Foley, Andover; Louis Locatell, Jr., Wellesley Hills, and Charles M. Zepp, Boylston, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1979, Ser. No. 106,905
Int. Cl.³ G03C *1/84, 5/54, 1/40, 1/48*
U.S. Cl. 430—221 **50 Claims**



10. A photographic product for forming a multicolor diffusion transfer image, said product comprising a first sheet-like element comprising a first support carrying a red-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer, and a blue-sensitive silver halide emulsion layer, said silver halide emulsion layers having associated therewith, respectively, a cyan image dye-providing material, a magenta image dye-providing material and a yellow image dye-providing material; a second sheet-like element comprising a second support; said first and second sheet-like elements being in superposed relationship, or adapted to be brought into superposed relationship, with said supports being outermost; at least one of said supports being transparent to permit photoexposure of said silver halide emulsions therethrough; a rupturable container releasably holding an aqueous alkaline processing composition, said rupturable container being so positioned as to be capable of discharging said processing composition between a pair of predetermined layers carried by said supports; an image-receiving layer carried by one of said supports; and a colored xanthene compound being disposed in a processing composition permeable layer carried by one of said supports, said xanthene compound having the formula



wherein X is $-SO_2-\underset{R'}{N}-COCH_3$ or $-SO_2-\underset{R'}{N}-CO_2(CH_2)_2Y$

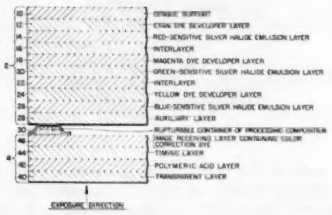
wherein R′ is alkyl; Y is an electron-withdrawing group and A is an anion.

4,258,119

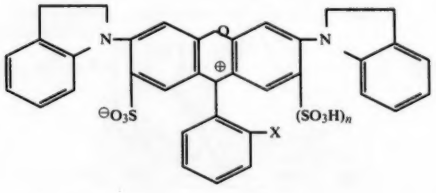
NOVEL XANTHENE COMPOUNDS AND PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING THE SAME

Richard L. Cournoyer, Waltham, and James W. Foley, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1979, Ser. No. 106,938
Int. Cl.³ G03C *1/40, 1/84, 5/54, 1/48*
U.S. Cl. 430—221 **50 Claims**



10. A photographic product for forming a multicolor diffusion transfer image, said product comprising a first sheet-like element comprising a first support carrying a red-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer, and a blue-sensitive silver halide emulsion layer, said silver halide emulsion layers having associated therewith, respectively, a cyan image dye-providing material, a magenta dye-providing material and a yellow image dye-providing material; a second sheet-like element comprising a second support; said first and second sheet-like elements being in superposed relationship, or adapted to be brought into superposed relationship, with said supports being outermost; at least one of said supports being transparent to permit photoexposure of said silver halide emulsions therethrough; a rupturable container releasably holding an aqueous alkaline processing composition, said rupturable container being so positioned as to be capable of discharging said processing composition betweeen a pair of predetermined layers carried by said supports; an image-receiving layer carried by one of said supports; and a colored xanthene compound being disposed in a processing composition permeable layer carried by one of said supports, said xanthene compound having the formula



wherein X is

$-SO_2-\underset{R'}{N}-COCH_3$ or $-SO_2-\underset{R'}{N}-CO_2(CH_2)_2Y$

wherein R′ is alkyl; Y is an electron-withdrawing group and n is 0 or 1.

4,258,120
SUBSTITUTED SULFONAMIDO COMPOUNDS, PHOTOSENSITIVE ELEMENTS, FILM UNITS, AND PROCESSES FOR RETAINING A PHOTOGRAPHIC IMAGE WITH SAME

Claude F. Gerbal, Bonneuil-sur-Marne, France; Thomas E. Gompf, Rochester, N.Y., and Pierre D. Collet, Nogent-sur-Marne, France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 24, 1979, Ser. No. 32,972
Claims priority, application France, Apr. 24, 1978, 78 12004
Int. Cl.³ G03C *1/40, 1/10, 7/00*
U.S. Cl. 430—223 **29 Claims**

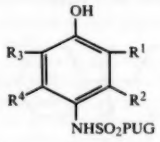
5. In a photographic film unit comprising:

(a) a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith at least one sulfonamido redox releaser;

(b) an image receiving layer; and

(c) an alkaline processing composition;

said film unit comprising a silver halide developing agent, the improvement wherein said sulfonamido redox releaser has the formula:



wherein:

(a) R^1 is alkyl, aryl, sulfamyl, carbamyl, carbonamido, carbonyl, carbonyloxy or sulfonamido;

(b) R^2 is alkyl having from 1 to 18 carbon atoms, aryl, or alkylphenyl having from 7 to 12 carbon atoms;

(c) R^3 and R^4 are independently alkyl, or aryl, or R^3 and R^4, taken together, form a fused substituted or unsubstituted carbocyclic or heterocyclic ring;

(d) $NHSO_2PUG$ represents a sulfonamido group;

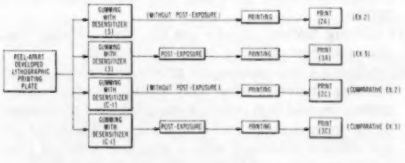
(e) PUG represents a photographically useful group; and

(f) at least one of R^1, R^2, R^3 or R^4, or any combination thereof, provides a molecular configuration of such size or shape as to render the compound nondiffusible under alkaline processing conditions.

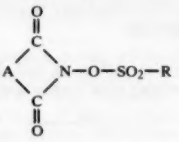
4,258,121
PHOTOPOLYMERIZABLE COMPOSITIONS

Teruo Kojima, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 6, 1980, Ser. No. 127,627
Claims priority, application Japan, Mar. 6, 1979, 54-25750
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—281 **33 Claims**



1. A photopolymerizable composition comprising a monomer having at least two ethylenically unsaturated groups capable of being photopolymerized by actinic irradiation and a photopolymerization initiator represented by the formula:



wherein A represents an arylene group, a substituted arylene group, an alkylene group, a substituted alkylene group, an alkenylene group, or a substituted alkenylene group and R represents an alkyl group, a substituted alkyl group, an aryl group, or a substituted aryl group.

4,258,122
PROCESS FOR PREPARING LITHOGRAPHIC PRINTING PLATE USING SILICATE CONTAINING-DESENSITIZER

Toshio Uchida; Yorimiti Yabuta; Hiromichi Tachikawa, and Teppei Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 30, 1978, Ser. No. 920,872
Claims priority, application Japan, Jun. 30, 1977, 52-78316
Int. Cl.² G03F *7/02*
U.S. Cl. 430—253 **17 Claims**

1. A process for preparing a lithographic printing plate, which comprises:

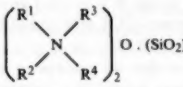
imagewise exposing a light-sensitive lithographic printing plate material having a photo-hardenable light-sensitive layer thereon using actinic light,

peel-apart developing the exposed lithographic printing plate material to produce a lithographic printing plate having an oily ink-receptive printing image,

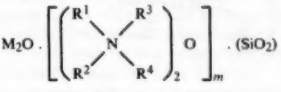
applying a desensitizer for a lithographic printing plate to the entire surface of the lithographic printing plate bearing said printing image, said desensitizer comprising (i) at least one silicate represented by general formula (I), (II) and (III)

$$M_2O.(SiO_2)_n.qH_2O \quad (I)$$

(II)



(III)



wherein M represents an alkali metal atom; R^1, R^2, R^3 and R^4, which may be the same or different, each represents a hydrogen atom, an alkyl group or a hydroxyalkyl group; n represents a number of from 1 to 8.5; q represents a number of from 1 to 12; m represents a number of greater than 0 and up to 10; and p represents a number of from 4 to 5000;

(ii) at least one wetting agent;

(iii) a hydrophilic high molecular weight compound which is at least one member selected from the group consisting of methyl cellulose, ethyl cellulose, carboxymethyl cellulose, carboxyethyl cellulose, ethyl hydroxyethyl cellulose, ethyl methyl cellulose, hydroxymethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxyethyl methyl cellulose, hydroxyethyl methyl cellulose, hydroxypropyl methyl cellulose, sodium carboxymethyl cellulose, sodium cellulose sulfate, dextrin, shellac, an alginate, polyvinyl pyrrolidone, polyvinyl alcohol, polyacrylamide or a copolymer thereof, an acrylic acid copolymer, a vinyl

methyl ether/maleic anhydride copolymer, a vinyl acetate/maleic anhydride copolymer or a styrene/maleic anhydride copolymer; and

(iv) water, and

irradiating the entire surface of said desensitizer-bearing lithographic printing plate with actinic light.

4,258,123

PHOTOSENSITIVE RESIN COMPOSITION

Akira Nagashima, Shizuoka, and Shigeru Sato, Odawara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 29, 1979, Ser. No. 70,556

Claims priority, application Japan, Aug. 29, 1978, 53-105196

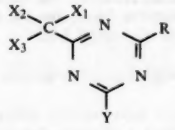
Int. Cl.³ G03C *1/68*

U.S. Cl. 430—281 **20 Claims**

1. A photosensitive resin composition comprising:

(a) a photopolymerizable or photocrosslinkable ethylenic unsaturated compound;

(b) a compound of the formula (I):

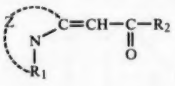


(I)

wherein X_1, X_2 and X_3 may be the same or different and each represents a hydrogen atom, a chlorine atom or a bromine atom, at least one of X_1, X_2 and X_3 representing a chlorine atom or a bromine atom; Y is

wherein X_1, X_2 and X_3 are as defined above, $-NH_2$, $-NHR'$, $-NR'_2$, $-SR'$, $-OR'$ or $-R'$ where R' is an alkyl group or an aryl group; R is an alkyl group, an aryl group or an alkenyl group and R may be substituted;

(c) a compound of the formula (II):



(II)

where Z represents the non-metallic atoms necessary for completing a nitrogen-containing heterocyclic nucleus; R_1 is an alkyl group or a substituted alkyl group, R_2 is an alkyl group, an aryl group or a substituted aryl group; and

(d) a dye precursor.

4,258,124

PHOTOSENSITIVE COMPOSITION

Shigeki Shimizu, and Akinobu Oshima, both of Tokyo, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

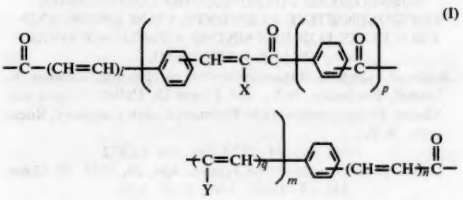
Filed Sep. 7, 1979, Ser. No. 73,289

Claims priority, application Japan, Sep. 14, 1978, 53/112998

Int. Cl.³ G03C *1/68*

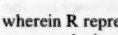
U.S. Cl. 430—285 **8 Claims**

1. A photosensitive composition, which comprises: a polyester having dicarboxylic acid units represented by formula (I):



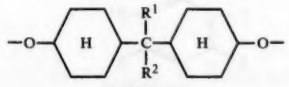
(I)

wherein l, m, n, p and q are independently an integer of 0 or 1 but at least one of l, m and n is a value of 1, X and Y are independently hydrogen or X and Y are combined to form an alkylene group containing 1–4 carbon atoms; and said polyester having alkylene glycol units represented by formula (II)



(II)

wherein R represents an alkylene group containing 2–4 carbon atoms and r is an integer of 2–4 and said polyester also having hydrogenated bisphenol units represented by formula (III):



(III)

wherein the amount of said hydrogenated bisphenol is sufficient to improve the chemical resistance of the polymer without diminishing its photosensitivity, and wherein

represents a hydrogenated benzene ring, and R^1 and R^2 independently represent a hydrogen or an alkyl group containing 1–6 carbon atoms.

4,258,125

METHOD OF MAKING HAND PROOFS OF COLOR PRINTS

Ronald D. Edhlund, 3200 Nordic Rd., Mount Prospect, Ill. 60056

Continuation of Ser. No. 632,101, Nov. 14, 1975, abandoned. This application May 8, 1978, Ser. No. 904,135

Int. Cl.³ G03C *7/16*; G03F *3/10*

U.S. Cl. 430—293 **1 Claim**

1. A hand proof process for making colored prints, said process comprising the steps of:

(a) placing a substrate in a fixed position on a machine;

(b) applying a first coloring material to said substrate, said coloring material comprising a single color including powdered printer's ink pigment mixed with an ink-like carrier;

(c) rubbing talcum powder on the first coloring material after said first coloring material has dried;

(d) applying a non-transparent photosensitizer over said first coloring material after said talcum powder has been rubbed on said first coloring material, said photosensitizer being water soluble and comprising a pigmented polyvinyl alcohol sensitized with a sensitizer selected from the group consisting of bichromate and diazo salts;

(e) exposing said photosensitizer to light through a photographic mask;

(f) removing the portions of the photosensitizer which are not exposed to light;

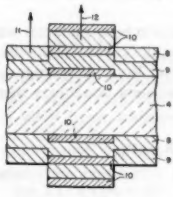
(g) removing the portions of the first coloring material which are no longer protected by the photosensitizer;
(h) removing the remaining photosensitizer with a fluid that does not affect the first coloring material, said fluid comprising a solvent which does not have any affect upon the pigmented resins used in the ink, whereby said first coloring material is uncovered by photosensitizer;
(i) applying an isolation layer over the remaining first coloring material, said isolation layer comprising a clear and transparent layer of lacquer;
(j) applying a second coloring material over said isolation layer after said isolation layer has dried, said second coloring material comprising a single color including powdered printer's ink pigment mixed with an ink-like carrier;
(k) rubbing talcum powder on said second coloring material after said second coloring material has dried;
(l) applying a non-transparent photosensitizer over said second coloring material after said talcum powder has been rubbed on said second coloring material, said photosensitizer being water soluble and comprising pigmented polyvinyl alcohol sensitized with a sensitizer selected from the group consisting of bichromate and diazo salts;
(m) exposing said photosensitizer to light through a photographic mask;
(n) removing the portions of said photosensitizer which are not exposed to light;
(o) removing the portions of said second coloring material which are not protected by the photosensitizer; and
(p) removing the remaining photosensitizer with a fluid that does not affect the second coloring material, whereby said first and second coloring materials remaining after the removal of the photosensitizer are not covered by any photosensitizer.

4,258,126

HIGH RESOLUTION RECORDING MEDIUM AND METHOD FOR PRODUCING SAME

Leopold Hiesinger, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Division of Ser. No. 859,941, Dec. 12, 1977, Pat. No. 4,151,321. This application Jan. 19, 1979, Ser. No. 4,943
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658623
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—324 **27 Claims**



1. A method for producing a high resolution recording medium on a substrate, comprising the following steps:
(a) applying at least one reflecting layer of an inorganic material to a surface of the substrate;
(b) applying a photoresist material to the reflecting layer;
(c) exposing a patterned portion of the photoresist material by means of an exposure mask;
(d) developing the photoresist material;
(e) removing at least a portion of the reflecting layer not covered with photoresist material;
(f) removing the remaining photoresist material;
(g) applying a substantially uniformly thick interference layer of a translucent inorganic material to the surface of the substrate and the remaining reflecting layer;
(h) applying at least one additional reflecting layer of an inorganic material to the interference layer;
(i) applying a photoresist material to the additional reflecting layer;
(j) exposing a patterned portion of the photoresist material by means of an exposure mask;
(k) developing the photoresist material;
(l) removing the portion of the additional reflecting layer not covered with photoresist material; and
(m) removing the remaining photoresist material.

4,258,127

REVERSAL COLOR DEVELOPMENT PROCESS

Hiroshi Ishibashi, and Haruhiko Iwano, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 31, 1975, Ser. No. 627,821
Claims priority, application Japan, Oct. 31, 1975, 50-126240
Int. Cl.³ G03C *7/16*
U.S. Cl. 430—379 **10 Claims**

1. A reversal color development process for silver halide reversal color photographic materials including a first development and a color development which comprises carrying out the first development in the presence of a DIR compound of the hydroquinone type which releases a diffusible mercapto development inhibitor or releases an iodine ion upon development of silver halide grains or upon reaction with oxidation product of a color developing agent formed upon development of silver halide, contacting the photographic materials with an aqueous solution of a fogging agent capable of chemically fogging the silver halide of the photographic materials, and then subjecting the photographic materials to the color development.

4,258,128

TELLURIUM(II) COMPOUNDS AND COMPLEXES HAVING ORGANIC MOIETIES CONTAINING SILICON CONTAINING COMPOSITIONS, ARTICLES AND PHOTOIMAGING PROCESSES

Henry J. Gysling, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 1, 1978, Ser. No. 965,712
Int. Cl.³ G03C *1/72, 1/727*
U.S. Cl. 430—413 **11 Claims**

1. In a method of forming an image in a photographic element, said element comprising a support having thereon a layer comprising an imagewise distribution of catalytic nuclei, said method comprising the step of contacting said layer with an image-forming combination comprising (i) an oxidant and (ii) a reducing agent, whereby said nuclei catalyzes an image-forming reaction between said oxidant and said reducing agent, the improvement wherein said oxidant comprises a tellurium-(II) compound represented by the formula:

$$Te\text{-}[(CH_2)_nSiRR'R'']_2$$

wherein:
n is an integer from 1 to 10 and
R, R' and R'' are independently selected from the group consisting of alkyl, aryl and heterocyclic radicals.

2. A method of forming an image in a photographic element, said element comprising a support having thereon a layer comprising a photosensitive transition metal complex of a tellurium(ii) compound represented by the formula:

$$Te\text{-}[(CH_2)_nSiRR'R'']_2$$

wherein:
n is an integer from 1 to 10 and
R, R' and R'' are independently selected from the group consisting of alkyl, aryl and heterocyclic radicals; said method comprising the steps of:

(a) imagewise-exposing said photosensitive complex so as to form an imagewise distribution of physically developable catalytic nuclei in said layer and

(b) contacting said layer with an image-forming combination comprising (i) an oxidant and (ii) a reducing agent,

whereby said nuclei catalyze an image-forming reaction between said oxidant and said reducing agent.

3. A photographic element comprising a support having thereon a layer comprising a photosensitive transition metal complex of a tellurium(II) compound represented by the formula:

$$Te\text{-}[\text{-}(CH_2)_nSiRR'R'']_2$$

wherein:

n is an integer from 1 to 10 and

R, R′ and R″ are independently selected from the group consisting of alkyl, aryl and heterocyclic radicals.

10. An image-forming combination comprising (i) an oxidant comprising a tellurium(II) compound represented by the formula:

$$Te\text{-}[\text{-}(CH_2)_n\ SiRR'R'']_2$$

wherein:

n is an integer from 1 to 10 and

R, R′ and R″ are independently selected from the group consisting of alkyl, aryl, and heterocyclic radicals; and

(ii) a reducing agent.

4,258,129

THERMALLY DEVELOPABLE LIGHT SENSITIVE MATERIAL USING TRIVALENT AND TETRAVALENT CERIUM COMPOUNDS

Shinpei Ikenoue; Yoshiaki Suzuki, and Takao Masuda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 4, 1976, Ser. No. 711,741

Claims priority, application Japan, Oct. 31, 1974, 49-126240; Aug. 7, 1975, 50-96155

Int. Cl.[3] **G03C** *1/02*

U.S. Cl. 430—620 **17 Claims**

1. A heat developable image-forming light sensitive material which comprises; (a) an organic silver salt; (b) a photocatalyst and (c) a reducing agent in a support or in at least one layer provided on a support, said support or at least one layer of said layers further containing (d) at least one cerium compound selected from the group consisting of trivalent and tetravalent cerium compounds.

4,258,130

METHOD FOR DETECTION OF ANTIGENS

David H. Ashton, Brea, and George Tharrington, Jr., Yorba Linda, both of Calif., assignors to Hunt-Wesson Foods, Inc., Fullerton, Calif.

Filed Dec. 12, 1977, Ser. No. 859,300

Int. Cl.[3] **C12Q** *1/66*

U.S. Cl. 435—7 **9 Claims**

1. An improved method of increasing the specificity of detecting Salmonella antigens in a food sample containing non-Salmonella antigens of similar rod-like morphology capable of non-specific binding to the Fc portion of the IgG-anti-Salmonella antibody comprising the steps of:

enzymatically digesting IgG-anti-Salmonella antibody with a proteolytic enzyme to cleave the Fc portion from the Fab portion;

separating the Fab portion from the Fc portion;

labeling the Fab portion with a fluorescent dye;

incubating the food sample in a first broth followed by selective enrichment of the sample in a second broth;

exposing said incubated food sample to the labeled Fab portion; and

detecting the presence of Salmonella antigen in the food sample by incubating the exposed food sample, washing the sample and observing the fluorescence of the sample.

4,258,131

METHOD OF FRACTIONAL QUANTITATIVE DETERMINATION OF ISOENZYME OF LACTIC DEHYDROGENASE

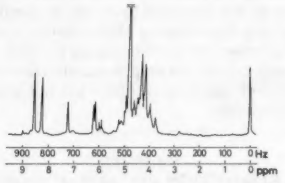
Isamu Takagahara, Kawanishi; Juniti Yamauti, Suita; Setsuko Yoshimura, Nara; Katsumi Fujii, Suita, and Takekazu Horio, Takatsuki, all of Japan, assignors to Oriental Yeast Co. Ltd., Tokyo, Japan

Filed Jul. 3, 1979, Ser. No. 54,416

Claims priority, application Japan, Jul. 10, 1978, 53-082979

Int. Cl.[3] **C12Q** *1/32*

U.S. Cl. 435—26 **1 Claim**



1. A method for the fractional quantitative determination of H-type and M-type lactic dehydrogenase in a biological sample comprising:

reacting a portion of said biological sample with an aqueous solution containing pyruvate and a mixture containing 1,6-DHNAD and NADH at a rate of 1,6-DHNAD/-NADH varying from 1/500 to 1/20,

meanwhile reacting a second portion of said biological sample with an aqueous solution containing pyruvate and NADH,

determining the ratio between lactic dehydrogenase activity obtained under the coexistent conditions of 1,6-DHNAD and NADH and lactic dehydrogenase activity obtained under non-coexistent conditions thereof, using the relationship

$$P=(P_H-P_M)R_H+P_M$$

wherein

R_H equals the ratio of H-type LDH activity to total LDH activity when 1,6-DHNAD is absent;

P_H equals the ratio of H-type LDH activity when 1,6-DHNAD is present, to the H-type LDH activity when 1,6-DHNAD is absent;

P_M equals the ratio of M-type LDH activity when 1,6-DHNAD is present, to the M-type LDH activity when 1,6-DHNAD is absent; and

P is the ratio of total LDH activity when 1,6-DHNAD is present, to the total activity when 1,6-DHNAD is absent; and

comparing said ratio with a standard value of which the inhibitory degree of isoenzyme has been previously found whereby the amount of isoenzyme in the sample is fractionally obtained.

4,258,132

PROCESS FOR PRODUCING AN AGGLUTINATING SUBSTANCE UTILIZING DEMATIUM ATCC 20524

Satoru Shinohara, No. 8-14, Takasago-cho, Hyuga-shi, Miyazaki-ken, Japan

Filed Oct. 3, 1978, Ser. No. 948,227
Claims priority, application Japan, Oct. 11, 1977, 52-121687; Aug. 10, 1978, 53-97664; Aug. 17, 1978, 53-100150
Int. Cl.[3] C12P *19/04;* C12R *1/645*
U.S. Cl. 435—101 3 Claims

1. A process for producing an agglutinating substance comprising cultivating an agglutinating substance-producing fungus having the identifying characteristics of Dematium ATCC 20524 at an acidic pH in a culture medium containing a carbon source until an agglutinating substance is produced and separating the agglutinating substance from the culture medium.

4,258,133

ENZYME-SUPPORT COMPLEXES

Bernard Mirabel, Orly, and Francois Meiller, Palaiseau, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Feb. 15, 1979, Ser. No. 12,394
Claims priority, application France, Feb. 16, 1978, 78 04354; Jan. 23, 1979, 79 01580
Int. Cl.[3] C12N *11/14*
U.S. Cl. 435—176 12 Claims

1. An enzyme-support complex comprising an enzyme fixed by covalent bond to a grafted inorganic support, said inorganic support having surface hydroxyl groups, said enzyme being bound to at least one reactive function selected from the class consisting of amine, halogen, sulfhydryl, aldehyde, and carboxyl functions, of an organic group selected from the class consisting of a linear or branched aliphatic radical whose chain contains between about 1 to 8 carbon atoms, a cyclane radical, an aryl radical and an alkylaryl radical; said organic group being grafted to said support by at least one ester bond obtained by reaction of at least one alcohol or phenol function of said organic group provided by an organic compound selected from the class consisting of an amino alcohol, a halo-alcohol, a mercapto-alcohol, an alcohol-aldehyde, an alcohol-acid, an amino-phenol, a halo-phenol, a mercapto-phenol, a phenol-aldehyde, and a phenol-acid with at least one hydroxyl group of the support.

4,258,134

NOVEL HYALURONIDASE BMP-8231 AND PRODUCTION THEREOF

Keizo Yoshida, Ibaraki; Takashi Fujii, Sekimachi, and Hiroyuki Kikuchi, Hachiouji, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed May 3, 1979, Ser. No. 35,719
Claims priority, application Japan, May 11, 1978, 53/56313
Int. Cl.[3] C12N *9/26*
U.S. Cl. 435—201 4 Claims

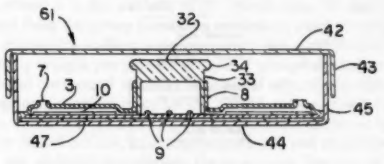
1. Hyaluronidase BMP-8231 having the characteristic of
(a) Type of Action:
Endo β-hexosaminidase;
(b) Substrate Specificity:
Degradable: Hyaluronic acid
Not Degradable:
Chondroitin sulfate A,
Chondroitin sulfate C and
Chondroitin;
(c) Optimum pH: Around pH 4.0;
(d) Stable pH range: 4.0–pH 11.3;
(e) Optimum temperature: Around 60° C.;
(f) Stable temperature range: Below 60° C.; and
(g) Stability against proteolytic enzyme: Stable.

4,258,135

DEVICE FOR USE IN THE STUDY OF BIOCHEMICAL OR ENZYMATIC REACTIONS

Henry E. Meunier, 24 avenue Alsace Lorraine, 38000 Grenoble, France

Continuation-in-part of Ser. No. 955,921, Oct. 30, 1978. This application May 21, 1979, Ser. No. 40,906
Int. Cl.[3] C12M *1/20*
U.S. Cl. 435—301 26 Claims



1. A device for the study of biochemical or enzymatic reactions produced by living organisms, comprising a sandwich of two plastic sheets sealed to each other, the first sheet of said sandwich being dimensioned and contoured so as to provide a central open area having upstanding walls, defining a central receptacle, said central receptacle being closed at its bottom by the second of said sheets, the said sandwich having internal thereof a plurality of radially-extending cavities providing individual reaction chambers, said reaction chambers having exhaust apertures therein, said reaction chambers being in communication with said central receptacle internal of said sandwich, said device comprising also a central cap, having walls corresponding to the walls of said central receptacle, the said walls of central cap corresponding to the walls of said central receptacle in close-fitting and essentially airtight relationship so as to establish the relationship of a piston and cylinder bore and enable creation of a pressure within said central receptacle upon said central cap being pushed downwardly.

4,258,136

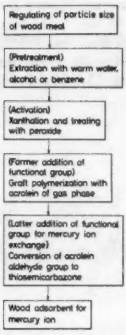
PROCESS FOR PRODUCING WOOD ADSORBENTS FOR MERCURY IONS BY GRAFT POLYMERIZATION OF ACROLEIN ONTO XANTHATED WOOD MEAL FOLLOWED BY CONVERSION TO THIOSEMICARBAZONE

Yasuhiko Hirabayashi, Tokyo, and Toshihiro Murayama, Yokohama, both of Japan, assignors to Forestry and Forest Products Research Institute, Ministry of Agriculture, Forestry and Fisheries, Ibaragi, Japan

Filed Mar. 2, 1979, Ser. No. 16,792
Claims priority, application Japan, Nov. 18, 1976, 51-138665
Int. Cl.[3] C02F *1/62;* C08B *13/02;* C08F *251/02;* B01J *39/22*
U.S. Cl. 521—25 4 Claims

1. A process for producing a wood adsorbent for adsorbing mercury ions which compresses impregnating a xanthated wood meal with a peroxide polymerization initiator to produce

active radicals thereon, graft polymerizing said xanthated wood meal with acrolein in a gas phase, and converting the


Regulating of particle size of wood meal
(Pretreatment) Extraction with warm water, alcohol or benzene
(Activation) Xanthation and treating with peroxide
(Former addition of functional group) Graft polymerization with acrolein of gas phase
(Latter addition of functional group for mercury ion exchange) Conversion of acrolein aldehyde group to thiosemicarbazone
Wood adsorbent for mercury ion

acrolein aldehyde groups present to thiosemicarbazone groups capable of ion exchange.

4,258,137

RIGIDIZED OPEN CELL POLYURETHANE FOAM

Joseph A. Cogliano, Pasadena, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Oct. 11, 1979, Ser. No. 83,923
Int. Cl.[3] C08G *18/14, 18/38, 18/82*
U.S. Cl. 521—55 **6 Claims**

1. A method for preparing rigidized polyurethane foams comprising admixing

A. a member of the group consisting of

(1) a urethane-containing prepolymer having polyether or polyester backbone segments end-capped with an aromatic isocyanate and

(2) an aromatic polyisocyanate and a polyol selected from the group consisting of polyethers and polyesters;

B. about 0.4 to 1,000 moles of water for each mole of NCO; and

C. 10 to 200% by weight of said group member A of an epoxy resin,

to form a flexible foam and thereafter treating with an epoxy curing agent to rigidize the flexible foam.

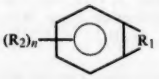
4,258,138

METHOD OF FOAMING THERMOPLASTIC POLYMERIC MATERIALS USING TETRAZOLE-CONTAINING HETEROCYCLES

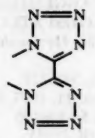
Thomas C. Britton, Portage, Mich., assignor to The Dow Chemical Company, Midland, Mich.

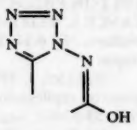
Filed Oct. 15, 1979, Ser. No. 84,966
Int. Cl.[3] C08J *9/10*
U.S. Cl. 521—90 **12 Claims**

1. A method for the production of expanded resinous material which comprises incorporating into a thermoplastic polymeric resinous material polycyclic, tetrazole-containing, fused ring heterocycle blowing agents of the formula



wherein R_1 is a radical selected from the group consisting of





and R_2 is one or more members of the group consisting of hydrogen and the lower alkyls (C_1–C_6) wherein n is an integer from 1 to 5.

4,258,139

PROCESS FOR PRODUCING FLAME-RESISTANT FOAM RESINS

Toshio Yukuta; Takumi Ishiwaka, both of Yokohama, and Kiyoshi Usui, Kawasaki, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 24, 1979, Ser. No. 87,838
Claims priority, application Japan, Oct. 25, 1978, 53/131130
Int. Cl.[3] C08G *18/14*
U.S. Cl. 521—110 **7 Claims**

1. A process for producing flame-resistant foam resins, which comprises reacting at least one organic polyisocyanate selected from the group consisting of diphenylmethane diisocyanate, crude diphenylmethane diisocyanate and polymethylene polyphenyl isocyanate with urea, the urea being used in a chemical equivalent ratio of not less than 1.0 per said organic polyisocyanate, said reacting releasing ammonia gas from urea to result in said foam resins.

4,258,140

STORAGE-STABLE PREPOLYMERS SPRAYABLE FROM A PRESSURE VESSEL

Heinrich Horacek, Ludwigshafen; Robert Gehm, Limburgerhof; Otto Volkert, Weisenheim; Sarbananda Chakrabarti, Ludwigshafen; Mathias Pauls, Geiselbullach, and Peter Weyland, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1979, Ser. No. 24,828
Int. Cl.[3] C08G *18/14, 18/76, 18/48*
U.S. Cl. 521—114 **6 Claims**

1. In the process for the manufacture of a dimensionally stable polyurethane foam by releasing the pressure on a mixture of prepolymers which is held in a one-compartment container under greater than atmospheric pressure and thereafter curing said foam by interaction with the atmosphere, the improvement comprising employing a mixture of prepolymers which has a shelf life of at least 60 days at 60° C., said prepolymers containing isocyanate groups and being admixed with blowing agents, wherein the prepolymers used, having an NCO content of from 5 to 25 percent by weight, based on the weight of the prepolymer are prepared by the reaction of a mixture of diphenylmethane-diisocyanates and polyphenyl-polymethylene-polyisocyanates with trifunctional or tetrafunctional polyols having a hydroxyl number of from 40 to 500 and a molecular weight of from 500 to 5000, and containing chemically bonded tertiary amino groups in the polymer chain, which polyols are selected from the group consisting of polyester-polyols, polyether-polyols and mixtures thereof, or by reaction of mixtures of such polyols with nitrogen-free polyester-polyols and/or polyether-polyols.

4,258,141
PROCESS FOR MANUFACTURE OF FLEXIBLE POLYURETHANE FOAMS WITH CYANIC ACID DERIVATIVES

Wolfgang Jarre, Ludwigshafen; Gerhard Mueller, Munich; Otmar Zipp, Osnabrueck, and Eckhard Ropte, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 10, 1979, Ser. No. 28,663

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1978, 2815554

Int. Cl.[3] **C08G** *18/14*

U.S. Cl. 521—114 **16 Claims**

1. A process for the manufacture of flame-resistant flexible polyurethane foams by a reaction of aromatic polyisocyanates, polyols, flame inhibitors, and blowing agents as well as optionally, chain extenders and additives, wherein a mixture of diphenylmethane diisocyanates and polyphenylene polymethylene polyisocyanates containing 40 to 90 percent by weight diphenylmethane diisocyanates based on the total weight of said mixture is used as aromatic polyisocyanate, and that a cyanic acid derivative selected from the group consisting of cyanamide, dicyandiamide, guanidine, biguanidine, cyanoguanidine, guanidine carbonate, cyanuric acid alkyl ester having 1 to 10 carbon atoms in the alkyl radical, cyanuric acid hydrazide, and melamine is used as the flame inhibitor, and water is used as the blowing agent.

4,258,142
CLARIFIED OLEFIN POLYMER COMPOSITION

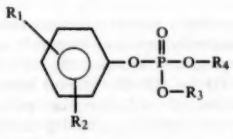
Toshio Ohzeki, Urawa; Mitsuo Akutsu, Katsushika, and Junji Kawai, Arakawa, all of Japan, assignors to Argus Chemical Corp., Brooklyn, N.Y.

Filed Aug. 30, 1978, Ser. No. 937,961

Int. Cl.[3] **C08K** *23/06, 23/12, 23/20;* **C09K** *3/00*

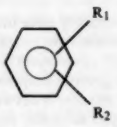
U.S. Cl. 525—2 **21 Claims**

1. A molded olefin polymer composition having improved clarity as a result of incorporating an additive, comprising a polymer of an alpha-olefin having 2 to 6 carbon atoms and per 100 parts by weight of alpha-olefin polymer from 0.005 to 5 parts by weight of at least one phenyl phosphate compound having the formula



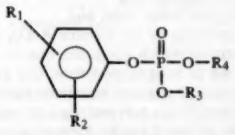
in which R_1 and R_2 are independently selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 18 carbon atoms, an alkoxy group having 1 to 18 carbon atoms, a cycloalkyl group having 5 to 12 carbon atoms, a phenyl group, and a group

in which R_5 is a hydrogen atom or an alkyl group having 1 to 18 carbon atoms; R_3 is selected from the group consisting of an alkyl group having 1 to 18 carbon atoms,

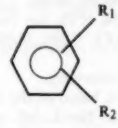


and R_4; and R_4 is a hydrogen atom or a metal atom equivalent $M_{1/a}$ where a is the valence of the metal atom M and M is selected from the group consisting of barium, calcium, magnesium, potassium, sodium, zinc, and aluminum; and from 0.3 to 3 parts by weight per part by weight of phosphate compound of a metal compound selected from metal salts of non-nitrogenous monocarboxylic acids having 6 to 18 carbon atoms, metal oxides, metal hydroxides, and metal chlorides, the metal being at least one of barium, calcium, magnesium, and strontium.

13. An additive composition for improving the clarity of a molded alpha-olefin polymer having 2 to 6 carbon atoms, comprising a phenyl phosphate compound having the formula



in which R_1 and R_2 are independently selected from the group consisting of a hydrogen atom and an alkyl group having 1 to 18 carbon atoms; R_3 is selected from the group consisting of an alkyl group having 1 to 18 carbon atoms,



and R_4; and R_4 is a hydrogen atom or a metal equivalent $M_{1/a}$ where a is the valence of the metal atom M and M is selected from the group consisting of barium, calcium, magnesium, potassium, sodium, zinc and aluminum; and from 0.3 to 3 parts by weight per part by weight of phosphate compound of a metal compound selected from metal salts of non-nitrogenous monocarboxylic acids having 6 to 18 carbon atoms, metal oxides, metal hydroxides, and metal chlorides, the metal being at least one of barium, calcium, magnesium, and strontium.

4,258,143
MOLDING COMPOSITIONS

John R. Dombroski, and Max F. Meyer, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 5, 1979, Ser. No. 55,091

Int. Cl.[3] **C08F** *51/06*

U.S. Cl. 525—64 **24 Claims**

1. Polymer composition comprising the reaction product of

(a) from about 50 to about 85% by weight, based on the weight of said reaction product, of an ethylenically unsaturated polyester derived from an α,β-ethylenically unsaturated dicarboxylic acid with a saturated aliphatic polyol, and

(b) from about 50 to about 15% by weight, based on the weight of said reaction product, of a modified polyolefin derived from an α,β-ethylenically unsaturated dicarboxylic acid anhydride and an aliphatic polyolefin selected

from the group consisting of polyethylene, polypropylene and polybutylene.

21. The method of preparing unsaturated polyester useful in shrinkage and corrosion resistant molding compositions comprising reacting an acid component containing at least one unsaturated acid with a glycol component until the acid number of the esterification mixture is between about 40 and about 60, adding a carboxylated aliphatic polyolefin selected from the group consisting of polyethylene, polypropylene, and polybutylene in an amount of between greater than about 10 and 50% any weight based on the weight of the polyester components, and continuing the esterification until an acid number of between about 25 and about 35 is reached.

4,258,144
POLYPHENYLENE ETHER BLENDS

Clifford W. Childers, and Raymond F. Uber, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 21, 1979, Ser. No. 96,351
Int. Cl.[3] **C09F** *0/00*
U.S. Cl. 525—91 **21 Claims**

1. A composition comprising

(a) a polyphenylene ether resin, and

(b) a block copolymer of the formula $A\text{-}D)_y$ wherein A is a polymer segment which comprises one or more polymer blocks formed at least in part from one or more conjugated diene monomers and/or one or more monovinylarene monomers, D is a polymer segment which comprises one or more polymer blocks formed from one or more lactone monomers, and y is 1, 2, 3 or 4.

4,258,145
TERNARY POLYMER BLENDS

Roy F. Wright, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 14, 1979, Ser. No. 75,448
Int. Cl.[3] **C08L** *53/02*
U.S. Cl. 525—99 **18 Claims**

1. A polymer blend comprising:

30 to 90 weight percent, based on the weight of the polymer constituents of the blend, of a conjugated diene-monovinylarene block copolymer of the form A—B—A or $(AB+_nY$, where A represents a block of polymerized monovinylarene monomer, B represents a block of polymerized conjugated diene units, Y is a residual unit of a polyfunctional coupling agent or a polyfunctional initiator, and n is 2, 3, 4, 5 or 6;

5 to 35 weight percent of an ethylene-propylene-nonconjugated diene terpolymer; and

5 to 50 weight percent of a thermoplastic polyolefin.

4,258,146
ORGANIC FILLERS FOR ELASTOMERS

Richard D. Balanson, Morgan Hill; James Economy, San Jose, both of Calif.; Samuel J. Huang, Storrs, Conn., and Thor L. Smith, Los Altos Hills, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 28, 1979, Ser. No. 79,660
Int. Cl.[3] **C08L** *83/06, 83/10*
U.S. Cl. 525—106 **8 Claims**

1. A process for increasing the mechanical strength of an elastomer, said process comprising the steps of:

(1) forming a mixture of a silicone rubber elastomer containing reactive functionality with from about 1% to about 40% by weight of an organic prepolymer filler which contains functionality to react with said elastomer,

(2) separating said filler into a separate phase of reinforcing domains having diameters of from 0.01 to about 50 microns dispersed throughout said elastomer,

(3) curing the mixture to advance the molecular weight of the prepolymer filler and to bond it by covalent bonds to the elastomer.

4,258,147
ANTIFOAMING RESIN COMPOSITIONS

Robert W. Smearing, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 604,368, Aug. 13, 1975, abandoned, which is a continuation of Ser. No. 212,700, Dec. 27, 1971, abandoned. This application Sep. 6, 1979, Ser. No. 73,049
Int. Cl.[3] **C05L** *63/00*
U.S. Cl. 525—122 **6 Claims**

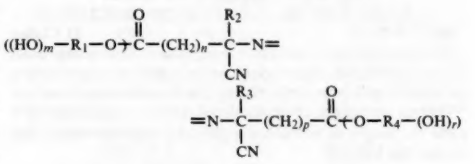
1. An epoxy resinous mixture characterized by low foaming including from about 0.05 to 10 percent, based on the resin weight, of polybutadiene in which at least 80 percent of the olefinic unsaturation consists of pendant vinyl groups.

4,258,148
GRAFT COPOLYMERS FROM UNSATURATED MONOMERS AND AZO DI-ESTER POLYOLS AND POLYURETHANES PREPARED THEREFROM

Kiran B. Chandalia, Hamden, and Frank J. Preston, Meriden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 22, 1977, Ser. No. 779,968
Int. Cl.[3] **C08L** *67/06;* **C08K** *5/06*
U.S. Cl. 525—168 **21 Claims**

1. In a process for the preparation of graft copolymer polyols which consists essentially of polymerizing an ethylenically unsaturated monomer or mixtures of such monomers in a polyol, the improvement characterized by polymerizing the unsaturated monomer in the presence of a polyol comprising from 0.01 to 100 percent by weight of an azo di-ester polyol of the formula:



wherein:

m and r independently represent integers from 2 to 5,

n and p independently represent integers from 0 to 5,

R_2 and R_3 independently represent alkyl of 1–4 carbons, and $((HO)_m—R_1—O)$ and $(O—R_4—(OH)_r)$ independently represent residues of polyether or polyester polyols $R_1(OH)_{m+1}$ and $R_4(OH)_{r+1}$, having an average equivalent weight ranging from about 250 to 5000, after removal of one hydroxy hydrogen therefrom, wherein R_1 and R_4 independently represent polyether polymer portions and polyester polymer portions thereof;

said polymerizing occurring at a temperature at or above which the azo-carbon linkages of the azo di-ester polyol the ruptured.

17. A graft copolymer dispersion prepared according to the process of claim **1**, wherein excess polyol is employed to form an azo di-ester polyol-unreacted polyol mixture and wherein said unsaturated monomer and azo di-ester polyol-unreacted polyol mixture are polymerized to produce a graft copolymer of unsaturated monomer and polyol dispersed in a polyol medium.

4,258,149

PROCESS FOR CURING SATURATED POLYMERS USING DIVINYL HYDANTOIN COAGENTS

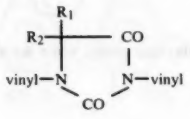
Hyman W. Zussman, Greenwich, Conn.; Martin Knell, Ossining, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 886,205, Mar. 13, 1978, Pat. No. 4,167,465, which is a division of Ser. No. 711,200, Aug. 4, 1976, Pat. No. 4,091,223. This application Mar. 8, 1979, Ser. No. 18,818

Int. Cl.[3] C08F *2/54, 255/00, 259/02, 259/04*

U.S. Cl. 525—193 22 Claims

1. A curable polymeric composition comprising, per 100 parts by weight of, an essentially saturated polymer or a mixture of said polymers capable of being cured at elevated temperature in the presence of 1 to 10 parts by weight of an organic peroxide or of being cured without peroxide by radiation at ambient temperature, and from 0.1 to 10 parts by weight of an unsaturated hydantoin of the formula



wherein R_1 and R_2 are independently each hydrogen, alkyl of 1 to 6 carbon atoms or phenyl, or R_1 and R_2 together are alkylene of 4 to 6 carbon atoms.

4,258,150

ALKENYLATION OF MONOVINYL AROMATIC POLYMERS

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 20, 1979, Ser. No. 58,984

Int. Cl.[3] C08F *8/02*

U.S. Cl. 525—316 19 Claims

1. A process for the alkenylation of monovinyl aromatic polymer comprising mixing a solution of a monovinyl aromatic polymer with an elemental alkali metal selected from the group consisting of sodium, potassium, lithium, and mixtures thereof in the presence of a polymerization inhibiting amount of a tertiary amine containing 3 to 10 carbon atoms per molecule under conditions suitable for producing a solution of alkali metal activated polymer and reacting the solution of alkali metal activated polymer with at least one conjugated diolefin under conditions such as to produce a monovinyl aromatic polymer containing a plurality of alkenyl branches along the polymer backbone, wherein the mixing of the monovinyl aromatic polymer and the alkali metal and the reaction of the alkali metal activated polymer with the conjugated diene are both conducted in the temperature range of about 25° C. to about 200° C., the elemental alkali metal is employed in an amount in the range of about 0.01 to about 10 parts by weight per 100 parts by weight of the monovinyl aromatic polymer, and the conjugated diene is employed in an amount of about 0.05 to about 1.0 mole per mole of monovinyl units in the polymer.

4,258,151

PENTAPEPTIDE MODIFIED RESIN

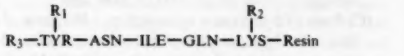
Gideon Goldstein, Short Hills, N.J., and David H. Schlesinger, Lombard, Ill., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Division of Ser. No. 6,894, Jan. 26, 1979, Pat. No. 4,190,647, which is a continuation-in-part of Ser. No. 851,778, Dec. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 631,176, Nov. 11, 1975, abandoned. This application Jun. 12, 1979, Ser. No. 47,907

Int. Cl.[3] C08F *8/30*

U.S. Cl. 525—327 2 Claims

1. An intermediate polypeptide of the following sequence:



wherein R_1 and R_2 are protective groups on reactive side chains, R_3 is a protecting group on an amino group of the TYR amino acid and is removable under conditions which do not affect the R_1 and R_2 groups, and the resin is an insoluble polymer having a stable physical form and is attached to a carboxylic group of the LYS amino acid through a functional group of the resin by a covalent bond.

4,258,152

PENTAPEPTIDE MODIFIED RESIN

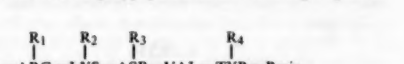
Gideon Goldstein, Short Hills, N.J., and David H. Schlesinger, Lombard, Ill., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Division of Ser. No. 6,893, Jan. 26, 1979, Pat. No. 4,190,646, which is a continuation-in-part of Ser. No. 851,777, Nov. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 631,175, Nov. 11, 1975, abandoned. This application Jun. 12, 1979, Ser. No. 47,909

Int. Cl.[3] C08F *8/30*

U.S. Cl. 525—327 2 Claims

1. An intermediate polypeptide of the following sequence:



wherein R_1, R_2, R_3, R_4 and R_5 are protecting groups with R_1, R_2, R_3 and R_4 being protecting groups on reactive side chains, and wherein the R_5 protecting group is on an amino group of the ARG amino acid and is removable under conditions which do not affect the R_1, R_2, R_3 and R_4 groups, and the resin is an insoluble polymer having a stable physical form and is attached to a carboxyl group of the TYR amino acid through a functional group of the resin by a covalent bond.

4,258,153

FLAME RETARDING POLYESTER COMPOSITION

Yoshiyuki Yomamoto, Suzuka; Akira Yoshioka, Nagoya, and Masanobu Morikawa, Tokyo, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 9, 1979, Ser. No. 19,252

Claims priority, application Japan, Mar. 22, 1978, 53-31637

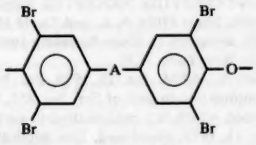
Int. Cl.[3] C08G *65/48*

U.S. Cl. 525—397 5 Claims

1. A flame retarding thermoplastic polyester composition comprising an admixture of:

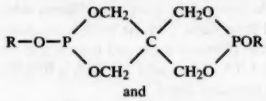
(A) a thermoplastic polyester comprising a condensation product of an aromatic dicarboxylic acid and an alkanediol,

(B) from 3 to 30 parts by weight per 100 parts of the thermoplastic polyester, of a polymeric flame retarding agent having, in the recurring unit, a structure represented by the formula



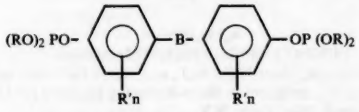
wherein A represents a member selected from the group consisting of an alkylene group having 1 to 6 carbon atoms, an ether, a carbonyl thioether and a sulfone group, said polymeric flame retarding agent having a molecular weight of from about 1000 to 5000, and

(C) from 0.05 to 5 parts by weight per 100 parts of the polyester of at least one phosphite compound selected from the group consisting of compounds represented by the general formulas (I) and (II)



(I)

and



(II)

wherein R is a monovalent alkyl group having 6 to 20 carbon atoms, R′ is hydrogen or a monovalent alkyl group having 1 to 6 carbon atoms, η is an integer of 2 to 4, and B represents a member selected from the group consisting of an alkylene group having 1 to 6 carbon atoms, ether, carbonyl, thioether and sulfone groups.

4,258,154

AROMATIC POLYESTER

Kayomon Kyo, Kyoto; Nakaba Asahara; Yasuhiko Asai, both of Uji; Isamu Hirose, Kyoto, and Sadao Kato, Uji, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed Jun. 15, 1979, Ser. No. 49,025

Claims priority, application Japan, Jun. 15, 1978, 53-72774

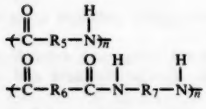
Int. Cl.[3] C08L *77/00, 67/00*

U.S. Cl. 525—425 **22 Claims**

1. A resin composition consisting essentially of:

(A) an aromatic polyester-polycarboxylic anhydride prepared from a diphenol, a functional derivative thereof, or a mixture thereof, and an aromatic dicarboxylic acid, a functional derivative thereof, or a mixture thereof, the proportion of the acid anhydride linkage which forms an integral part of the polymeric chain being about 0.2 to about 50% based on the total number of ester linkages and f acid anhydride linkages and

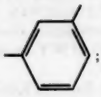
(B) a polyamide containing therein a repeating unit of the following formula (IV):



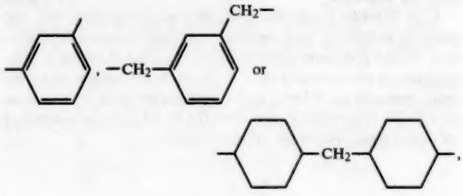
(IV)

(V)

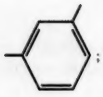
wherein R_5 is an alkylene group having 4 to 11 carbon atoms; R_6 is an alkylene group having 4 to 11 carbon atoms or



R_7 is an alkylene group having 4 to 11 carbon atoms,



R_7 being an alkylene group when R_6 is



and n is an integer of from 30 to 500.

4,258,155

BLENDS OF POLYETHERIMIDES AND POLYAMIDEIMIDES

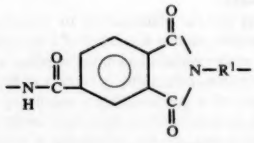
Fred F. Holub, Schenectady, N.Y., and Gary A. Mellinger, Louisville, Ky., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 3, 1979, Ser. No. 99,931

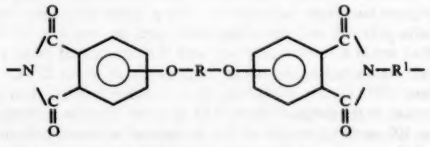
Int. Cl.[3] C08L *79/08*

U.S. Cl. 525—431 **7 Claims**

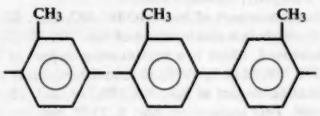
1. A polymeric blend comprising, by weight, (a) from 5 to 95% of a polyamideimide comprising essentially chemically combined units of the formula

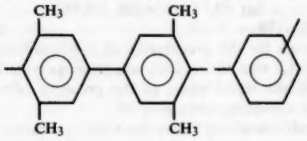


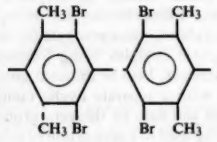
and (2) from 95% to 5% of a polyetherimide comprising essentially chemically combined units of the formula

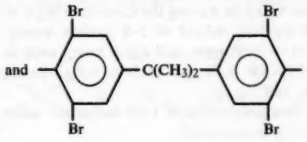


where R is a member selected from the class consisting of (a) the following divalent organic radicals:

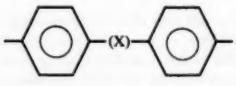




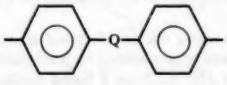




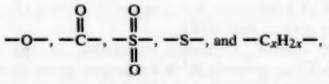
and (b) divalent organic radicals of the general formula,



where X is $-C_yH_{2y}-$, y is a whole number equal to from 1 to 5 inclusive and R^1 is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, (c) $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (d) divalent radicals included by the formula,



where Q is a member selected from the class consisting of



and x is a whole number equal to from 1 to 5 inclusive.

4,258,156

METHOD OF FABRICATION OF A TRANSPARENT LAMINATED PRODUCT

Jacques Guerrini, Chilly Mazarin; Jeanne Berthet, Velizy Villacoublay; Gilbert Gaussens, Meudon, and Francis Lemaire, Chatillon, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 1, 1978, Ser. No. 956,645
Claims priority, application France, Nov. 3, 1977, 77 33008
Int. Cl.³ C08L *63/00*
U.S. Cl. 525—531 **8 Claims**

1. An adhesive substance for bonding together two parts at a prepolymerization temperature between approximately 10°–80° C. and at a pressure below 2 bar in which at least one of said parts is of glass, wherein said substance contains at least one resin selected from the group consisting of acrylic and methacrylic esters of epoxy resins representing between 20 and 60% by weight of said substance and a tertiary amine methacrylate representing 40 to 80% by weight of said substance.

4,258,157

INVERSION POLYMERIZATION PROCESS FOR PRODUCING VINYL RESINS USING COATED REACTORS

Paul O. Hong, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 12, 1979, Ser. No. 19,957
Int. Cl.³ C08F *2/00, 2/18*
U.S. Cl. 526—62 **16 Claims**

1. In a process of inversion polymerizing substantially water-insoluble polymerizable ethylenically unsaturated monomer(s) in a reaction vessel by first forming a continuous monomer(s) phase in the presence of a monomer-soluble surface active agent and a monomer-soluble catalyst, polymerizing said monomer phase at a temperature in the range of about 10° C. to about 90° C. with agitation until a conversion to polymer less than about 20% occurs, adding sufficient water to the monomer-polymer mixture with agitation and in the presence of at least about 0.01% by weight of a water-soluble suspending agent for said monomer(s) to form a suspension wherein water is the continuous phase, then polymerizing the suspension at a temperature in the range of about 10° C. to about 90° C. to convert the remaining monomer(s) to polymer, the improvement which comprises (1) applying at least one coating to the internal surfaces of said reaction vessel, said coating being comprised of a gel-forming protein, (2) polymerizing the continuous monomer phase in constant contact with said coating, and (3) polymerizing said continuous water phase in constant contact with said coating, whereby polymer buildup on said internal surfaces is substantially eliminated.

4,258,158

MANUFACTURE OF ETHYLENE HOMOPOLYMERS AND COPOLYMERS

Erich Pfeiffer, Wesseling, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 1, 1978, Ser. No. 930,058
Int. Cl.³ C08F *6/10*
U.S. Cl. 526—68 **4 Claims**

1. In a process for the continuous manufacture of ethylene homopolymers or of copolymers of ethylene with up to 15 mole %, based on the ethylene, of α-monoolefins of 3 to 8 carbon atoms, by catalytically polymerizing the monomer or monomers at from 60° to 115° C. and at ethylene partial pressures of from 1 to 40 bars in an alkane hydrocarbon of 4 to 6 carbon atoms, which is liquid under the polymerization conditions and is a solvent for the monomer or monomers but a non-solvent for the polymer formed, the polymer being isolated by

(a) discharging, from the polymerization chamber, a mixture essentially consisting of polymer, alkane hydrocarbon and monomer or monomers,

(b) bringing the mixture from stage (a) to from 1.1 to 3 bars and to from 20° to 120° C., to form a gaseous phase, essentially consisting of the monomer or monomers and alkane hydrocarbon, the constituents of which phase are recycled to the polymerization chamber, and a solid phase essentially consisting of polymer with from 0.1 to 8 percent by weight, based on the weight of the polymer, of alkane hydrocarbon adhering thereto, and

(c) flushing the solid phase from stage (b) at from 1 to 2 bars, and at from 20° to 130° C., with an amount of nitrogen which is from 1 to 30 times the amount by volume of the polymer, to form a solid phase consisting of substantially pure polymer, which is separated off as such, and a gaseous phase consisting essentially of alkane hydrocarbon and nitrogen, the improvement comprising:

(d) adjusting the gaseous phase from stage (c) to from 1.1 to 40 bars above atmospheric pressure and lowering the temperature to the point that two phases form, namely a gaseous phase essentially consisting of nitrogen, which can, if desired, be combined with the nitrogen for stage (c), and a liquid phase essentially consisting of alkane hydrocarbon, and

(e) separating the liquid phase from stage (d) into two portions, by evaporating from 2 to 50 percent by volume of the liquid phase at from 1 to 3 bars to form the first portion, which is combined with the gaseous phase from stage (c), and recycling the remaining amount of the liquid phase, as the second portion which may or may not be in the gaseous state in an intermediate stage, to the polymerization chamber.

4,258,159

PROCESS FOR THE POLYMERIZATION OF OLEFINS

Charles Bienfait, Vilvoorde, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 414,997, Nov. 12, 1973, abandoned. This application Dec. 4, 1975, Ser. No. 637,636

Claims priority, application Luxembourg, Nov. 24, 1972, 65548; Jun. 6, 1973, 67751

Int. Cl.[3] **C08F** *4/02, 10/02*

U.S. Cl. 526—114 **12 Claims**

1. A process for the low pressure polymerization and copolymerization of alpha-olefins which comprises conducting the polymerization and copolymerization in the presence of a catalyst system comprising:

(a) an organic compound of a metal of Groups IA, IIA, IIB, IIIA and IVA of the Periodic Table, being selected from alkyl metal compounds, alkyl metal hydrides and alkyl metal halides; and

(b) a solid catalyst complex, said complex prepared by reacting (1) a transition metal compound of the metals of Groups IVB, VB and VIB of the Periodic Table selected from halides, oxyhalides, alkoxyhalides, oxyalkoxides, and alkoxides with (2) a porous aluminum oxide having an internal porosity of greater than 0.3 cm^3/g and a specific surface area of between 200 and 400 m^2/g on which is chemically attached an amount of magnesium compound selected from organic oxygen containing magnesium compounds containing only C_1–C_{20} organic radical bonded to magnesium via oxygen and magnesium dihalides, said amount being such that between 1×10^{-3} and 5×10^{-3} milligram-atom of magnesium is present per square meter of specific surface area of the porous oxide and the magnesium compound having been chemically attached on the porous aluminum oxide in a liquid medium, said medium being in the form of water or of an organic diluent.

4,258,160

PROCESS FOR POLYMERIZING BUTADIENE

Adel F. Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 863,492, Dec. 22, 1977, abandoned, which is a continuation of Ser. No. 721,025, Sep. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 574,788, May 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 491,723, Jul. 25, 1974, abandoned. This application Apr. 6, 1979, Ser. No. 27,553

Int. Cl.[3] **C08F** *4/60, 136/06*

U.S. Cl. 526—138 **23 Claims**

1. A process for the preparation of polybutadiene high in syndiotactic-1,2 structure which comprises polymerizing 1,3-butadiene in the liquid phase in the presence of a catalyst composition consisting essentially of:

(a) a cobalt-containing component selected from the class consisting of cobalt halides, carboxylates, thiocarboxylates, carbonate, thiocarbonate and complexes of said halides, carboxylates, thiocarboxylates, carbonate and thiocarbonate, said complex being formed between the cobalt and a nitrogen, keto or thioketo group in the same compound or with a separate cyclic compound having both a nitrogen and keto or thioketo group therein, said component being used in a proportion of 0.01–1 millimoles per 100 grams of butadiene;

(b) a reducing agent having the formula AlR_2X wherein R is a hydrocarbon radical of 1–8 carbon atoms, and X is halogen or hydrogen, said agent being used in a proportion of 10–500 moles per mole of cobalt-containing component; and

(c) COS in a proportion of 1–10 moles per mole of cobalt-containing component.

4,258,161

PROCESS FOR POLYMERIZING PROPYLENE

Genjiro Kakogawa; Masayoshi Hasuo; Yoshinori Suga, all of Yokohama; Hisashi Kitada, Tokyo, and Yumito Uehara, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Jan. 22, 1979, Ser. No. 5,471

Claims priority, application Japan, Feb. 14, 1978, 53-15758; Sep. 12, 1978, 53-111865

Int. Cl.[3] **C08F** *4/66, 10/06*

U.S. Cl. 526—153 **12 Claims**

1. A process for polymerizing propylene, which comprises polymerizing propylene in the presence of a catalyst system composed of:

(A) a solid titanium trichloride-based complex which is a fine particulate solid obtained by precipitation at a temperature below 150° C. from a liquid medium by reducing titanium tetrachloride with an organic aluminum compound in an ether or a thioether and which is expressed by the formula: $TiCl_3.(AlR_p^3X_{3-p})_x.(C)_y$, wherein R^3 is a hydrocarbon group of 1–20 carbon atoms, X is a halogen atom, p is a value within the range of $0 \leqq p \leqq 2$, C is an ether or a thioether, x is a value less than 0.15 and y is a value greater than 0.001;

(B) an organic aluminum cocatalyst of the formula: $AlR_n^1Cl_{3-n}$, wherein R^1 is a n-propyl group or a n-hexyl group and n is a value of 1.95–2.10; and

(C) an electron donor compound.

4,258,162

POLYMERS OF CONJUGATED DIENES WHICH HAVE TERMINAL CONJUGATED UNSATURATED ALICYCLIC FUNCTIONAL GROUPS

Carl A. Uraneck, and John E. Burleigh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

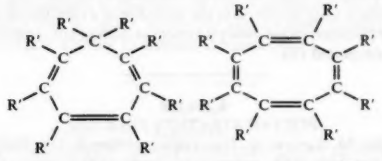
Filed Jul. 10, 1979, Ser. No. 55,680
Int. Cl.[3] C08F 4/48; C08C 19/32, 19/30, 19/40
U.S. Cl. 526—173 42 Claims

1. The process for the preparation of a conjugated diene polymer containing alicyclic conjugated unsaturated functional groups which comprises:

(a) polymerizing at least one conjugated diene hydrocarbon monomer, optionally further employing a hydrocarbon monovinylarene comonomer, employing an organolithium initiator, under anionic solution polymerization conditions, thereby preparing a polymerization admixture containing a conjugated diene polymer containing active lithium termination,

wherein said organolithium initiator is a cyclic organomonolithium initiators having delocalized conjugated unsaturation,

wherein said initiator is a product prepared by the addition reaction of approximately equimolar amounts of a hydrocarbyl monolithium compound with an alicyclic conjugated triene or tetraene selected from the group consisting of



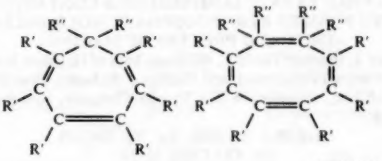
(I), (II)

wherein R′ is hydrogen or alkyl such that the total number of carbon atoms in the molecule does not exceed 20, and

thereafter (b) treating said polymerization admixture by a treating mode selected from the group consisting of (D), (E), and (F);

wherein said treating mode (D) employs an active hydrogen-containing material effective to terminate the activity of said lithium termination, thereby resulting in a conjugated diene polymer containing terminal alicyclic conjugated unsaturated functional group singly per polymer molecule;

said treating mode (E) employs at least a stoichiometric amount of alicyclic unsaturated triene or tetraene selected from the group consisting of



(III), and [and] (IV).

wherein R″ is R′, chlorine, bromine, or iodine, with the proviso that only one R″ is halogen in each molecule of said (III) or (IV), thereby resulting in a conjugated diene polymer containing terminal conjugated unsaturation, and

said treating mode (F) employs a coupling agent capable of reacting with the resulting lithium, terminated polymer, thereby resulting in a coupled or branched polymer.

4,258,163

PARTIALLY SAPONIFIED POLYVINYL ACETATES AND THEIR APPLICATION IN THE HOMO- AND COPOLYMERIZATION OF VINYL CHLORIDE

Bela Mariasi; Laszlo Molnar; Janos Toth; Imre Gulya, all of Kazincbarcika; Miklos Nagy; Ervin Wolfram, both of Budapest; Miklos Zrinyi, Erd; Gaborne Kovacs, and Laszlone Jaksity, both of Budapest, all of Hungary, assignors to Borsodi Vegyi Kombinat, Kazincbarcika, Hungary

Continuation-in-part of Ser. No. 762,963, Jan. 27, 1977, abandoned. This application May 23, 1979, Ser. No. 41,626
Claims priority, application Hungary, Jan. 28, 1976, BO 1595
Int. Cl.[3] C08F 2/20
U.S. Cl. 526—202 3 Claims

1. A process for the homo- and copolymerization of vinyl chloride in the presence of 0.03 to 0.3 w% of at least one protective colloid, comprising in an aqueous medium using as a pore-forming additive in a quantity of about 0.01 to 0.4 weight % with reference to the weight of the vinyl chloride used a partially saponified polyvinyl acetate (vinyl acetate-vinyl alcohol copolymer) having a degree of hydrolysis of about 30 to 65 mole%, a degree of polymerization of about 100 to 6000 and having a block structure; said partially saponified polyvinyl acetate being further characterized by forming a gel with bifunctional aldehydes in an acid catalyzed reaction within a shorter period of time than needed for the formation of a gel under identical conditions from a partially saponified polyvinyl acetate of identical acetate content having a structure of statistical distribution.

4,258,164

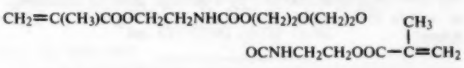
RETICULATE POLYMERS BASED ON OLIGOURETHANACRYLATES AND METHOD FOR THEIR MANUFACTURE

Alfred A. Berlin, Leninsky prospekt 57, kv. 9; Tamara Y. Kefeli, Krasnoprudnaya ulitsa, 22/24, kv. 103; Nina V. Varlamova, Dmitrovskoe shosse 40/7, kv. 20, all of Moscow; Grigory M. Strongin, prospekt Lenina 83, kv. 2a, Dzerzhinsk Gorkovskoi oblasti; Judif M. Altshuler, Uchebny pereulok, 8, kv. 67, Dzerzhinsk Gorkovskoi oblastic; Boris I. Kolomazov, prospekt Pobedy 1/2, kv. 8, Dzerzhinsk Gorkovskoi oblasti, and Alexei V. Efimov, prospekt Lenina 85, kv. 43, Dzerzhinsk Gorkovskoi oblasti, all of U.S.S.R.

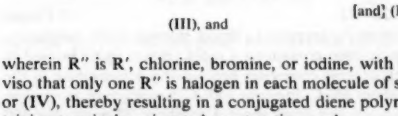
Continuation of Ser. No. 556,329, Mar. 7, 1975, abandoned, which is a division of Ser. No. 467,516, May 6, 1974, abandoned. This application May 21, 1979, Ser. No. 40,888
Int. Cl.[3] C08F 26/02, 126/02, 226/02
U.S. Cl. 526—301 7 Claims

1. A polymer having reticulate structure on the basis of an oligourethanacrylate, characterized by the formula:

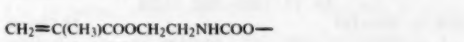
2. A polymer having reticulate structure on the basis of an oligourethanacrylate, characterized by the formula:



3. A polymer having reticulate structure on the basis of an oligourethanacrylate, characterized by the formula:



4. A polymer having reticulate structure on the basis of an oligourethanacrylate, characterized by the formula:



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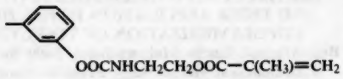
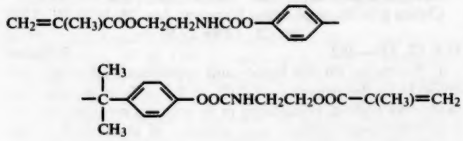


5. A polymer having reticulate structure on the basis of an oligourethanacrylate, characterized by the formula:



4,258,165

METHOD FOR PRODUCING VINYL CHLORIDE POLYMERS

Tomoyuki Emura, and Yasuhiro Moriuchi, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, and Sumitomo Bakelite Company, Limited, both of Japan

Filed Apr. 12, 1979, Ser. No. 29,512
Claims priority, application Japan, Apr. 12, 1978, 53/43469
Int. Cl.³ C08F *14/06*
U.S. Cl. 526—321 **12 Claims**

1. A method for producing a vinyl chloride resin comprising suspension polymerizing vinyl chloride alone or a mixture of a major amount of vinyl chloride and a minor amount of at least one monomer copolymerizable therewith, in the presence of an amount sufficient to form 10–80 wt. % of gel content in the product of at least one polyfunctional monomer having two or more ethylenic double bonds in the molecule, at a temperature of 0° to 50° C. until the whole monomer in the polymerization system is substantially polymerized, and obtaining vinyl chloride resin comprising 10 to 80% by weight of tetrahydrofuran-insoluble vinyl chloride resin gel fraction and the balance of tetrahydrofuran-soluble fraction with an average polymerization degree of 1,000 or more.

4,258,166

LOW DENSITY POLYETHYLENE FILM

Peter J. Canterino, Towaco, and Craig E. Allen, Clark, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jun. 8, 1979, Ser. No. 46,750
Int. Cl.³ C08F *10/02*
U.S. Cl. 526—348.1 **4 Claims**

1. A uniaxially oriented thermoplastic film having improved film strength in the direction transverse to the direction of orientation, said film comprising low density polyethylene which has been stretched in a single direction at a temperature below its crystalline melting point, said low density polyethylene film being characterized by a density, prior to stretching, of within the approximate range of 0.915 g/cm^3 to 0.935 g/cm^3.

4,258,167

PROCESS FOR PRODUCING POWDERY ISOTACTIC POLYOLEFIN

Kazumi Tsubaki; Noriaki Koto, and Kouichi Maeda, all of Ichihara, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Jan. 25, 1979, Ser. No. 6,380
Claims priority, application Japan, Feb. 13, 1978, 53-14059; Sep. 13, 1978, 53-112488
Int. Cl.³ C08F *4/02, 10/06*
U.S. Cl. 526—128 **16 Claims**

1. A process for producing a powdery isotactic polyolefin having high isotactic characteristic and a narrow size distribution which comprises forming a polymerization catalyst system including a solid catalytic component (A) formed by the preparatory process consisting essentially of reacting a Grignard reagent with a chain or cyclic hydropolysiloxane having the unit formula:

$$R_a{}^1H_bSiO_{\frac{4-a-b}{2}}$$

(R^1 represents an alkyl, aryl, aralkyl, alkoxy or aryloxy group; a is o, 1 or 2; b is 1, 2 or 3 and $a+b \leqq 3$), to form a reaction product (a); reacting the reaction product (a) dissolved in an aromatic hydrocarbon solvent with at least one compound having the formula:

$$R^2{}_nM^{(z)}X_{z-n}$$

(R^2 represents a C_1 to C_{12} hydrocarbon moiety; M represents Al or Si; z represents atomic value of 3 or 4; X represents a halogen atom; n is 0, 1 . . . $(z-1)$) in the presence of the aromatic hydrocarbon solvent at a temperature lower than 85° C. to form a particulate reaction product (b); and reacting the particulate reaction product (b) with at least one titanium halide in the presence of an organic carboxylic acid ester (c) added in the preparatory process after the formation of reaction product (a) to obtain the solid catalytic component (A) and adding an organoaluminum compound (B) and then, polymerizing a C_3 or C_4 olefin in the presence of a catalytic amount of the polymerization catalyst system including component (A) and compound (B).

4,258,168

POLYMERIZATION PROCESS

Nicholas M. Karayannis, Naperville, and Sam S. Lee, Hoffman Estates, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 16, 1976, Ser. No. 696,812
Int. Cl.³ C08F *4/66, 10/06*
U.S. Cl. 526—139 **8 Claims**

1. In a process to polymerize alpha-olefins to normally-solid, substantially crystalline polymer utilizing a catalyst comprising a titanium halide and an aluminum alkyl, the improvement comprising adding to such catalyst effective amounts of an additive selected from the group consisting of aliphatic and aromatic esters of orthoformic and thiophosphoric acids wherein the aliphatic and aromatic groups are hydrocarbons or substituted hydrocarbons containing from 1 to about 12 carbon atoms, whereby the amount of n-hexane soluble polymeric product is decreased.

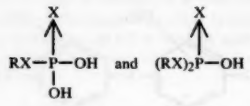
4,258,169

POLYISOCYANATE COMPOSITIONS CONTAINING IN-SITU FORMED PYROPHOSPHATE MOLD RELEASE AGENT AND PROCESS OF MAKING

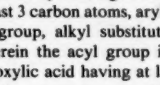
Richard A. Prather; David L. Williams, both of Houston; Robert M. Partin, Friendswood, and Warren J. Rabourn, Deer Park, all of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 26, 1980, Ser. No. 134,219
Int. Cl.³ C08G *18/28*
U.S. Cl. 528—72 **15 Claims**

1. A process for preparing a liquid, storage-stable, polyisocyanate composition containing a mold release agent formed in situ which process comprises heating at a temperature in the range of about 60° C. to about 190° C. a mixture of an organic polyisocyanate and from about 1 to about 20 parts, per 100 parts by weight of said polyisocyanate, of an acid phosphate selected from the class consisting of acid phosphates having the formulae



and mixtures of two or more of said acid phosphates wherein, in the above formulae, each R is independently selected from the class consisting of alkyl having at least 3 carbon atoms, alkenyl having at least 3 carbon atoms, aryl, aryl substituted by at least one alkyl group, alkyl substituted by at least one acyloxy group wherein the acyl group is the residue of an aliphatic monocarboxylic acid having at least 2 carbon atoms and



wherein R_1 is selected from the group consisting of alkyl, aryl and aryl substituted by at least one alkyl, one of A and B represents hydrogen and the other is selected from the class consisting of hydrogen, methyl, chloromethyl and 2,2,2-trichloroethyl; X is a chalogen selected from the class consisting of oxygen and sulfur; and m is a number having an average value of 1 to 25;

the said heating of said mixture being carried out for a time such that no phase separation occurs upon cooling the reaction mixture to ambient temperature.

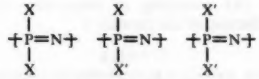
4,258,170

POLYPHOSPHAZENE POLYMERS CONTAINING PYRAZOLE OR IMIDAZOLE SUBSTITUENTS

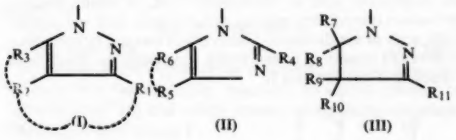
William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 20, 1979, Ser. No. 67,985
Int. Cl.³ C08G 83/00
U.S. Cl. 528—168 **19 Claims**

1. A polyphosphazene copolymer containing units represented by the formulas:



wherein X is represented by one or more of the following structural formulas:



wherein $R_{1\text{-}11}$ are independently selected from the group consisting of hydrogen, halogen, cyano, nitro, and substituted and unsubstituted alkyl, aryl, alkoxy, aryloxy, alkylmercapto, and dialkylamino radicals, and R_1 or 3 and R_2, and R_5 and R_6 taken together can form a substituted or unsubstituted benzene ring structure; X' can represent one or more substituents from the group consisting of a halogen radical, substituted and unsubstituted alkoxy, aryloxy, amino and mercapto radicals.

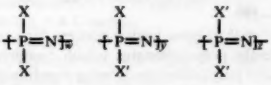
4,258,171

POLYPHOSPHAZENE POLYMERS CONTAINING SUBSTITUTED ALKYL/CYCLOALKYL SUBSTITUENTS

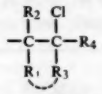
William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 4, 1979, Ser. No. 71,899
Int. Cl.³ C08G 73/00, 79/02
U.S. Cl. 528—168 **16 Claims**

1. A polyphosphazene polymer containing units represented by the formulas:



wherein X is:



in which $R_{1\text{-}4}$ are independently selected for each unit from the group consisting of hydrogen, halogen, nitro, cyano, alkylmercapto, arylmercapto, dialkylamino, alkyl, aryl, alkoxy, aryloxy, and heterocyclic radicals or R_1 and R_3 taken together form a cycloalkyl or heterocyclic ring; wherein X' is the same as X or is selected from the group consisting of chloro radicals and substituted and unsubstituted alkoxy, aryloxy, amino, mercapto radicals and mixtures thereof, and $20 \leqq (W+Y+Z) \leqq 50{,}000$.

4,258,172

ALKYLATED PHOSPHAZENE OLIGOMERS AND POLYMERS AND METHOD OF PREPARATION THEREOF

Harry R. Allcock, and Paul J. Harris, both of State College, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 25, 1979, Ser. No. 78,974
Int. Cl.³ C08G 73/00
U.S. Cl. 528—168 **5 Claims**

1. A phosphazene polymer having the formula: $\{8\ NP(Y_2)\}_nNPRH\}_m$ wherein Y represents chlorine, bromine, alkoxy, aryloxy, and amino groups, R represents a linear or branched alkyl, n represents an integer from 2 to 8, and m is an average value and is any value from 2 to 20,000.

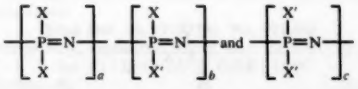
4,258,173

POLYPHOSPHAZENE POLYMERS CONTAINING MONOETHEROXY AND POLYETHEROXY SUBSTITUENTS

Donald N. Schulz, Hartville; Tai C. Cheng, Akron, and Thomas A. Antkowiak, Rittman, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 940,529, Sep. 8, 1978, abandoned. This application Oct. 11, 1979, Ser. No. 83,889
Int. Cl.³ C08G 73/00, 79/02
U.S. Cl. 528—168 **7 Claims**

1. A polyphosphazene polymer containing repeating units represented by the formulas:



wherein X is $R(OR')_nO$— in which R is alkyl containing from 1 to 20 carbon atoms, aryl, alkylaryl or arylalkyl, R' is an alkylene radical and n is an integer from 3 to 15; wherein X' is X or is selected from the group consisting of substituted or

unsubstituted alkoxy, alkenyloxy, aryloxy, alkenylaryloxy, amino and mercapto groups and wherein $20 \leqq (a+b+c) \leqq 50{,}000$ per polymer.

4,258,174

PROCESS FOR PREPARING POLYCARBONATES USING ISOUREA CATALYSTS

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1979, Ser. No. 107,894
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—199 **8 Claims**

1. An interfacial polymerization process for preparing high molecular weight polycarbonates which comprises reacting, under interfacial polycarbonate-forming conditions, a dihydric phenol with a carbonate precursor in the presence of a catalytic amount of an essentially linear isourea compound.

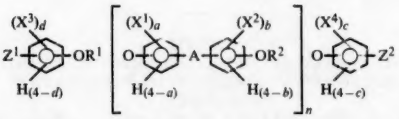
4,258,175

PROCESS FOR PREPARING AN ARYL ETHER

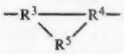
Sun-Mao Chen, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jul. 6, 1979, Ser. No. 55,255
Int. Cl.³ C08G *65/40, 65/42*
U.S. Cl. 528—217 **10 Claims**

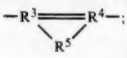
1. A process for preparing a compound of the formula



wherein X^1, X^2, X^3 and X^4 are independently selected from the group consisting of fluorine, chlorine, bromine, and iodine; n is an integer of from 1 to about 10; a, b, c, and d are each integers of from about 1 to about 4; Z^1 and Z^2 are independently selected from the group consisting of halogen and alkyl of from about 1 to about 15 carbon atoms; R^1 and R^2 are independently selected from the group consisting of alkylene containing from about 1 to about 12 carbon atoms, alkylene containing from about2 to about 12 carbon atoms, cycloalkylene of the formula



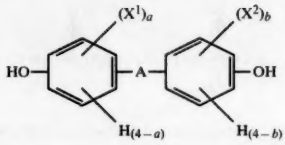
wherein R^3, R^4 and R^5 are independently selected from the group consisting of alkylene of from about 1 to about 5 carbon atoms, and cycloalkylenyl of the formula



and A is selected from the group consisting of R^3CR^4,

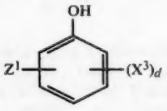
and O; comprising the steps of:

(a) reacting a halogenated diphenoxy compound of the formula



with from about 2 to about 12 moles per mole of said halogenated diphenoxy compound of an alkylene dihalide of the formula $X^1R^1X^2$ at a temperature of from about 50 to about 200 degrees centigrade for from about 30 to about 300 minutes in the presence of an inorganic base, whereby a halogenated aryl ether is produced; and sequentially

(b) reacting the halogenated aryl ether produced in step (a) with a halogenated phenol of the formula



at a temperature of from about 50 to about 200 degrees centigrade in the presence of an inorganic base for from about 1 to about 10 hours, wherein from about 0.1 to about 2.0 moles of said halogenated phenol per mole of said halogenated diphenoxy compound are charged to the reaction mixture and reacted.

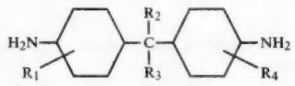
4,258,176

TRANSPARENT COPOLYAMIDE FROM 1,10-DISUBSTITUTED C_{11} DIAMINE

Josef Pfeifer, Therwil, Switzerland, and Dieter Reinehr, Kandern, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

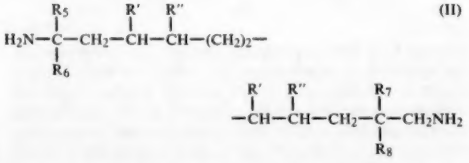
Filed Oct. 9, 1979, Ser. No. 83,143
Claims priority, application Switzerland, Oct. 18, 1978, 10772/78
Int. Cl.³ C08G *69/26*
U.S. Cl. 528—338 **9 Claims**

1. A transparent copolyamide having a reduced specific viscosity of at least 0.5 dl/g, measured on a 0.5% solution of m-cresol at 25° C., which copolyamide is obtained by reaction of a mixture (A) consisting of essentially stoichiometric amounts of a diamine of the formula I



(I)

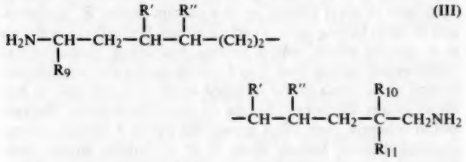
and isophthalic acid or terephthalic acid, or amide-forming derivatives thereof, or a mixture of isophthalic acid and terephthalic acid, or amide-forming derivatives thereof, either with a mixture (B) consisting of essentially stoichiometric amounts of a diamine of the formula II



(II)

and terephthalic acid or an amide-forming derivative thereof,

or a mixture of terephthalic acid and isophthalic acid, or amide-forming derivatives thereof, in a molar ratio of terephthalic acid, or amide-forming derivative: isophthalic acid, or amide-forming derivative, of 8:2 to 10:0, or with a mixture (C) consisting of essentially stoichiometric amounts of a diamine of the formula III



(III)

and terephthalic acid or isophthalic acid, or mixtures or amide-forming derivatives thereof, wherein

R′ and R″ independently of one another are each hydrogen or methyl,

R_1 to R_4 independently of one another are each hydrogen or alkyl having 1–4 C atoms,

R_5 is alkyl having 1–12 C atoms, aryl having 6–10 C atoms, or said aryl substituted by alkyl having 1–4 C atoms,

R_6 is hydrogen or alkyl having 1–6 C atoms, or

R_5 and R_6 together are alkylene having 4–7 C atoms,

R_7 is alkyl having 1–8 C atoms,

R_8 is hydrogen or alkyl having 1–5 C atoms,

R_9 is cycloalkyl which has 5–12 ring C atoms and which is unsubstituted or substituted by alkyl of 1–4 C atoms,

R_{10} is hydrogen or methyl, and

R_{11} is methyl, or

R_{10} and R_{11} together are alkylene having 4–11 C atoms,

the proportion of mixture (C) being 60–80 percent by weight, based on the total copolyamide, or the proportion of mixture (B) being 50–80 percent by weight, based on the total copolyamide, with the proviso that with a proportion of mixture (B) of up to 65 percent by weight, at most 70 mol.% of isophthalic acid, or of an amide-forming derivative thereof, in mixture (A) can be replaced by terephthalic acid or by an amide-forming derivative thereof, these weight percentages in the case of amide-forming derivatives of isophthalic acid or of terephthalic acid relating to identical functional groups.

4,258,177

TRANSPARENT COPOLYAMIDE FROM 1,10-DISUBSTITUTED C_{10} DIAMINE

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

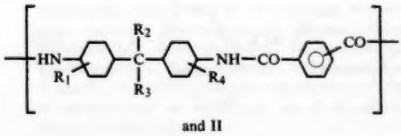
Filed Oct. 9, 1979, Ser. No. 83,144

Claims priority, application Switzerland, Oct. 18, 1978, 10773/78

Int. Cl.³ C08G *69/26*

U.S. Cl. 528—338 **8 Claims**

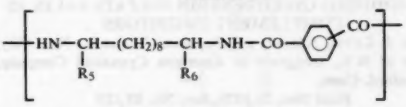
1. A transparent copolyamide which has a reduced specific viscosity of at least 0.5 dl/g, measured on a 0.5% solution in m-cresol at 25° C., and which consists of recurring structural elements of the formula I



(I)

and II

-continued



(II)

wherein the carbonyl groups are bound to the benzene nucleus in the 1,4-position in 50–85% of the sum of all structural elements of the formulae I and II, and in the 1,3-position in 50–15% of the sum of all structural elements of the formulae I and II,

R_1 to R_4 independently of one another are each hydrogen or alkyl having 1–4 C atoms,

R_5 and R_6 independently of one another are each ethyl, n-propyl, isobutyl, —$CH(R_7)(R_8)$ or —$CH_2CH(R_9)(R_{10})$,

R_7 is alkyl having 1–8 C atoms,

R_8 is alkyl having 1–4 C atoms,

R_9 is hydrogen or alkyl having 1–4 C atoms, and

R_{10} is alkyl having 2–8 C atoms,

and if R_5 and R_6 independently of one another are each ethyl, n-propyl, isobutyl or —$CH(R_7)(R_8)$ the proportion of structural elements of the formula I is 10–40 percent by weight, relative to the total weight of the polymer, and if R_5 and R_6 independently of one another are each a group —$CH_2CH(R_9)(R_{10})$ the proportion of structural elements of the formula I is 35–55 percent by weight, relative to the total weight of the polymer.

4,258,178

DISCHARGING GRANULAR LINEAR POLYCONDENSATES

Werner Hoerauf, and Guenter Valentin, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 1, 1978, Ser. No. 965,265

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1977, 2755941

Int. Cl.³ C08F *2/36, 6/00*

U.S. Cl. 528—502 **4 Claims**

1. A process for discharging granular nylons which are derived from alkanedicarboxylic acids of 6 to 12 carbon atoms and alkenediamines of 6 to 12 carbon atoms or polylactams which are derived from lactams of 6 to 12 carbon atoms, which are sensitive to molecular oxygen at elevated temperatures, said granules having a length of from 1 to 5 mm and a diameter of from 1 to 5 mm, from a treatment zone in which the nylons or polylactams have been continuously treated, at above 70° C., with inert gases which are free from molecular oxygen, and have subsequently been cooled, which process comprises withdrawing the nylons or polylactams at ≦ 50° C. through a narrow elongated discharge tube, the said tube always being filled with granular nylons or polylactams, whereby the granules absorb molecular oxygen on their surface within the discharge zone and thus prevent oxygen in the air entering the end of the discharge tube from contacting the hot granules in the treatment zone.

4,258,179

COATING AGENTS FOR SOLID MEDICAMENTS

Hiroitsu Kawata, Kawagoe; Tadayoshi Ohmura, Niiza; Hiroyoshi Shiozawa, Tokyo, and Munetaka Hattori, Yaizu, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1978, Ser. No. 971,498

Claims priority, application Japan, Dec. 29, 1977, 52-158102

Int. Cl.³ B01J *13/00*; C08B *11/08*

U.S. Cl. 536—95 **20 Claims**

1. A composition for coating a solid medicament comprising a hydrogel-like substance of a water-insoluble hydroxypropyl cellulose containing 5–16% by weight of a hydroxypropoxy group.

4,258,180

C6-MODIFIED CYCLODEXTRIN SULFATE SALTS AS COMPLEMENT INHIBITORS

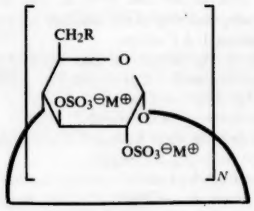
Arthur J. Lewis, Nanuet, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 5, 1979, Ser. No. 91,215

Int. Cl.³ C08B *37/02*

U.S. Cl. 536—112 **19 Claims**

1. A compound of the formula:



wherein N is an integer from 6–8; R is selected from the group consisting of hydrogen, bromo, azido and thiocyanato; and M is a pharmaceutically acceptable salt cation.

4,258,181

SUBSTITUTED 9,10-ANTHRACENEBISHYDRAZONES

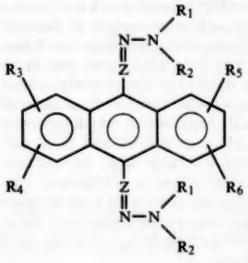
Keith C. Murdock, Pearl River, N.Y., and Frederick E. Durr, Ridgewood, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 939,591, Sep. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 855,146, Nov. 28, 1977, abandoned. This application May 7, 1979, Ser. No. 36,924

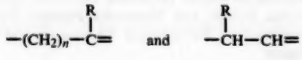
Int. Cl.³ C07C *109/16*

U.S. Cl. 542—415 **23 Claims**

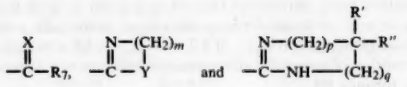
1. A compound selected from the group consisting of those of the formula:



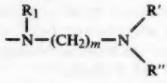
wherein Z is a trivalent moiety selected from the group consisting of those of the formulae:



wherein n is 0, 1, 2 or 3 and R is hydrogen, alkyl having up to 4 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, phenyl or benzyl; R_1 is selected from the group consisting of hydrogen and alkyl having up to 4 carbon atoms; R_2 is selected from the group consisting of hydrogen, alkyl having up to 4 carbon atoms, phenyl and monovalent moieties of the formulae:



wherein m is 2, 3, 4 or 5, p is 1, 2 or 3, q is 0, 1 or 2, R′ is hydrogen or alkyl having up to 4 carbon atoms, R″ is hydrogen or alkyl having up to 4 carbon atoms, R_7 is alkyl having up to 4 carbon atoms, amino, anilino, hydrazino, monohydroxyalkylamino having from 2 to 4 carbon atoms and wherein the carbon atom alpha to the nitrogen atom may not bear an hydroxy group, alkylamino having up to 4 carbon atoms, dialkylamino wherein each alkyl group has up to 4 carbon atoms, cycloalkylamino having from 3 to 6 carbon atoms, benzylamino, α-phenethylamino, β-phenethylamino, 2-furfurylamino, 3-furfurylamino, α-thenylamino, β-thenylamino, α-pyridylmethylamino, β-pyridylmethylamino, γ-pyridylmethylamino, indanylamino, pyrrolidino, piperidino, morpholino, thiomorpholino, N-methylpiperazino, alkoxy having up to 4 carbon atoms, alkylthio having up to 4 carbon atoms or a moiety of the formula:



wherein m, R_1, R′ and R″ are as hereinbefore defined and the moiety —NR′R″ may be pyrrolidino, piperidino, morpholino or N-methylpiperazino, X is oxo (O═), thioxo (S═) or imino (R′—N═ wherein R′ is as hereinbefore defined) and Y is oxy (—O—), thio (—S—), methylene (—CH_2—) or a divalent group of the formula:

wherein R_8 is alkyl having up to 4 carbon atoms or monohydroxyalkyl having from 2 to 4 carbon atoms and wherein the carbon atom alpha to the nitrogen atom may not bear an hydroxy group; and R_3, R_4, R_5 and R_6 are each individually selected from the group consisting of hydrogen, halogen (F, Cl, Br, I), hydroxy, nitro, amino, sulfonamido, alkyl having up to 3 carbon atoms and alkoxy having up to 3 carbon atoms; and the pharmacologically acceptable acid-addition and quaternary ammonium salts thereof.

4,258,182

QUATERNIZED AMINO-SUBSTITUTED STYRYL DYESTUFFS

Hermann Beecken, Berg.-Gladbach, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

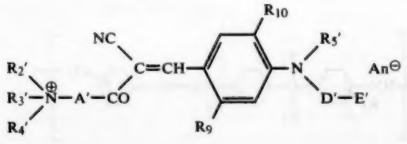
Filed Mar. 30, 1978, Ser. No. 891,806

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714653

Int. Cl.³ C09B *23/16*

U.S. Cl. 542—421 **13 Claims**

1. Cationic styryl dyestuff of the formula



wherein

R'_2 denotes C_1-C_4-alkyl, or benzyl or α- or β-phenylethyl unsubstituted or substituted by 1–2 chlorine, C_1-C_4-alkyl or C_1-C_4-alkoxy groups, or cyclopentyl or cyclohexyl unsubstituted or substituted by 1–2 C_1–C_4-alkyl groups,

R'_3 denotes hydrogen or C_1-C_4-alkyl and R'_4 denotes C_1-C_4-alkyl, or

R'_2, R'_3 and R'_4 together with the nitrogen atom to which they are bonded form imidazole or pyridine which is unsubstituted or substituted by 1 or 2 C_1-C_4-alkyl groups, or

R'_3 and R'_4 together with the nitrogen atom to which they are bonded form piperidine, pyrrolidine, morpholine, piperazine or hexamethyleneimine which is unsubstituted or substituted by 1–4 C_1-C_4-alkyl groups,

R'_5 denotes C_1-C_4-alkyl, or phenyl, benzyl or α- or β-phenylethyl unsubstituted or substituted by 1–2 chlorine, cyano, C_1-C_4-alkyl or C_1-C_4-alkoxy groups,

R_9 denotes hydrogen, C_1-C_4-alkyl, C_1-C_4-alkoxy or chlorine and

R_{10} denotes hydrogen or C_1-C_4-alkoxy, or

R'_5 and R_{10} together with the benzene ring and the nitrogen atom to which R'_5 is bonded form an indoline, tetrahydroquinoline or 2,3-dihydro-1,4-benzoxazine radical which is unsubstituted or substituted in the heterocyclic part by 1–4 C_1-C_4-alkyl or phenyl, or form a carbazole, phenoxazine or phenthiazine radical which is unsubstituted or substituted by 1–2 C_1-C_4-alkyl, or

R'_5 together with -D'-E' and the nitrogen atom forms pyrrolidine, piperidine, morpholine, thiomorpholine, thiomorpholine-S-dioxide or piperazine which is unsubstituted or substituted by 1–2 C_1-C_4-alkyl,

A' denotes

$$-CH_2-\underset{\underset{R_{11}}{|}}{CH}-O- \quad \text{or} \quad -(CH_2)_{2 \text{ or } 3}-NH-$$

R_{11} denotes hydrogen, C_1-C_4-alkyl or phenyl which is unsubstituted or substituted by 1–2 chlorines or C_1-C_4-alkyls,

D' denotes a direct bond or

$$-C_pH_{2p}- \text{ or } -C_nH_{2n}-X_1-C_mH_{2m}- \quad (\rightarrow E')$$

in which

m is 0–4,

n is 1–4,

p is 1–4 and

X_1 is O, S, SO_2, COO, OCO, NR_6—CO, CO—NR_6, NR_6—SO_2, SO_2—NR_6, $NCOR_7$, NHCONH, OCO—NH, NH—COO, OCO—CH_2—S, OCO—CH=CH or OCO—CH_2O,

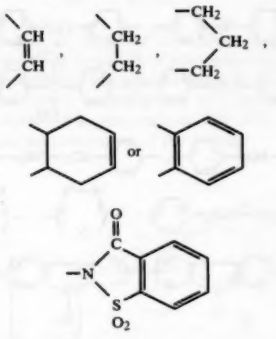
R_6 is H, CH_3, C_2H_5, allyl or venzyl;

R_7 is H or CH_3;

E' denotes phenyl substituted by cyclopentyl groups or 1–5 chlorines or by C_8-C_{12}-alkyl, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkylcarbonylamino, phenyl, phenoxy, phenylazo, phenylmercapto, phenylsulphonyl, phenylsulphamido, benzoyl, benzoyloxy, benzyl, benzoxy, phenylethyl, 2-phenylisopropyl, benzoylamino, phenylcarbamoyl, phenylsulphamoyl, cyclohexyl, bicyclo(2,2,1)hept-2-yl, benzoxazol-2-yl, benzimidazol-2-yl, benthiazol-2-yl or benztriazol-2-yl, an α- or β-naphthyl group which is unsubstituted or substituted by 1–3 C_1-C_2-alkyls, 1–2 C_3-C_8-alkyls, C_1-C_4-alkoxys, cyclopentyls or chlorines or C_1-C_4-alkoxycarbonyl, C_1-C_4-alkylcarbonyloxy, C_1-C_4-alkylcarbonylamino, benzoylamino, benzoyloxy, benzoxy, phenoxy, benzoyl, phenyl, benzyl, benzoxazol-2-yl, benzimidazol-2-yl, benzthiazol-2-yl, benztriazol-2-yl or 2-phenylisopropyl, dibenzofuranyl, dibenzthiophene, benzoxazol-2-yl, benzthiazol-2-yl or benzimidazol-2-yl which is unsubstituted or substituted by C_1-C_2-alkyl, C_1-C_2-alkoxy or chlorine, or

wherein

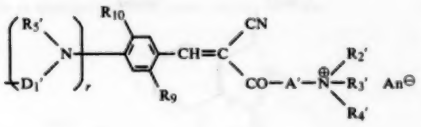
Z represents



which are unsubstituted or substituted by 1–2 C_1-C_2-alkyl and in the phenyl nucleus also by 1–2 chlorine atoms, and—if R'_5 and R'_{10} are cyclised with one another——D'—E' also represents C_1-C_4-alkyl, or

—D'—E' represents C_2-C_3-alkylene which links the nitrogen atom and the o'-position of the 1,4-phenylene ring to form an indoline or tetrahydroquinoline radical and is unsubstituted or substituted by 1–3-methyl groups, or

—D'—E' denotes



wherein

R'_2, R'_3, R'_4, R'_5, R_9, R_{10} and A', independently of the second chromophoric part of the molecule which links to D'_1, have the meanings indicated above,

r represents 0 or 1 and, when r=0, the two radicals R_{10} conjointly form a direct bond, an oxygen bridge or a sulphur bridge and—if r is 1—the two radicals R'_5, together with the two nitrogen atoms to which they are bonded and D'_1, form piperazine,

D'_1 represents o-, m- or p-xylylene which is unsubstituted or substituted by 1–2 chlorines or represents

$$-C_tH_{2t}[(Y_1-W)_u-Y_2-C_tH_{2t}]_v- \qquad (IX)$$

wherein

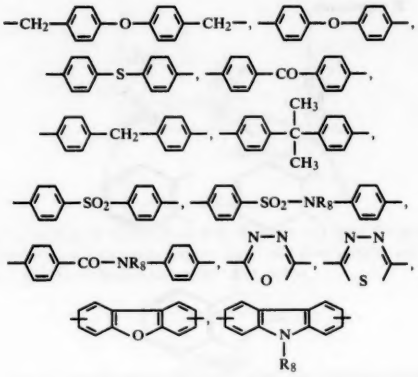
u and v denote 0 or 1 and

t denotes 2–4 and—if Y_1 or Y_2 links to C_tH_{2t} via a CO or SO_2 group—t can also be 1,

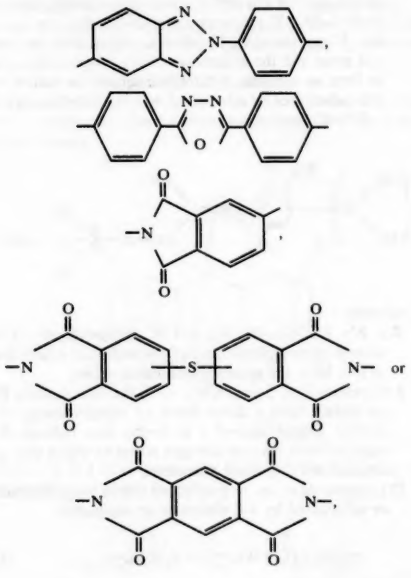
Y_1 and Y_2 independently of one another have the same meanings as X_1 and, when u is O Y_2 also represents the groupings S—S, O—COO, NR_6, $NCOR_7$, NR_6—CO—NR_6, NR_6—CO—CO—NR_6, NR_6—SO_2—NR_6,

CO—NR_7CO, CO—NH—NH—CO or O—CO—CO—O, and

W represents an aliphatic, cycloaliphatic, aromatic or heterocyclic linking element C_wH_{2w}, in which w=2–10, vinylene, 1,3- or 1,4-cyclohexylene, cyclohexane-1,2-, -1,3- and -1,4-dimethylene, or o- and m- or p-phenylene which is unsubstituted or substituted by C_1- to C_2-alkyl, C_1- to C_2-alkoxy or halogen, 4,4'-diphenylene or 1,2-, 1,4- or 1,5-naphthylene, which are unsubstituted or substituted by methyl, methoxy, chlorine,



in which R_8=H, methyl or ethyl,



which are unsubstituted or substituted by 1–4 methyl, ethyl or chlorine and

$An^{\ominus}$ represents an anion, and wherein the abovementioned alkyl radicals are unsubstituted or substituted by 1–2 chlorine, cyano, C_1-C_4-alkoxy, phenoxy, naphthoxy, benzoyloxy, allyloxy, C_1-C_4-alkylcarbonyloxy or C_1-C_4-alkoxycarbonyl groups, and the phenyl groups, in turn, are unsubstituted or substituted by 1-2 chlorine, cyano, C_1-C_4-alkyl or C_1-C_4-alkoxy groups.

4,258,183

PROCESS FOR THE PREPARATION OF CEPHALOSPORIN COMPOUNDS

David C. Humber, London; Stuart B. Laing, Harrow, and Gordon G. Weingarten, London, all of England, assignors to Glaxo Group Limited, London, England

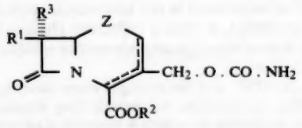
Continuation-in-part of Ser. No. 27,804, Apr. 6, 1979, abandoned. This application Sep. 20, 1979, Ser. No. 77,758

Claims priority, application United Kingdom, Apr. 6, 1979, 12215/79

Int. Cl.³ C07D *501/02*

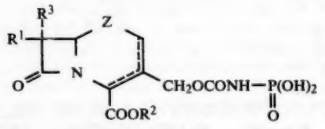
U.S. Cl. 544—22 **3 Claims**

1. In a process for the preparation of a 3-carbamoyloxymethyl cephalosporin of formula



(II)

wherein R^1 represents a C_1–C_{40} protected amino group; R^2 represents a group selected from the group consisting of hydrogen atoms and carboxy blocking groups; R^3 represents a group selected from the group consisting of hydrogen atoms and C_1–C_8 alkyl, C_1–C_8 alkylthio and C_1–C_8 alkoxy groups; Z is >S or >S→O (α- or β-); and the dotted line bridging the 2-, 3- and 4-positions of the molecule indicates that the compounds may be ceph-2-em or ceph-3-em compounds and salts thereof, the step which consists in hydrolysing a compound of formula



wherein R^1, R^2, R^3, Z and the dotted line are as hereinbefore defined, and salts thereof.

4,258,184

CEPHALOSPORIN DERIVATIVES

Fumio Kai, Fujisawa; Takashi Tsuruoka, Kawasaki; Osamu Makabe, Tokyo; Shigeharu Inouye, Okohama; Hitoshi Ikeda, Kawasaki; Yuzo Kazuno, Hachiohji; Shokichi Nakajima, Yokohama; Shigeo Seki, Tokyo, and Taro Niida, Yokohama, all of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

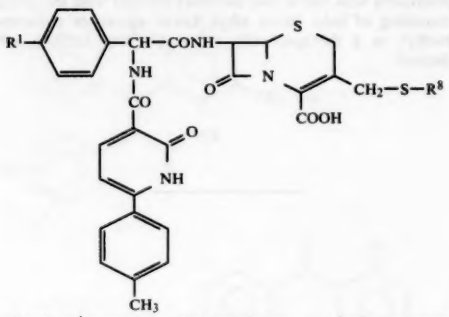
Continuation-in-part of Ser. No. 837,991, Sep. 29, 1977, abandoned. This application Mar. 13, 1979, Ser. No. 20,224

Claims priority, application Japan, Oct. 2, 1976, 51/118727; Mar. 13, 1978, 53/27784

Int. Cl.³ C07D *501/56*

U.S. Cl. 544—27 **5 Claims**

1. A cephalosporin compound of the formula



wherein R^1 represents a hydrogen atom or a hydroxy group, and R^8 represents a 5-carbamoyl-1,3,4-thiadiazol-2-yl or 1-methyl-1,2,3,4-tetrazol-5-yl group and pharmaceutically acceptable salts thereof.

4,258,185

PYRIDAZINONE COMPOUNDS

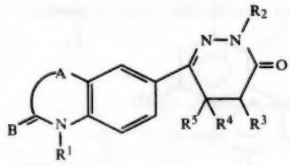
Toru Nakao, Nakatsu; Shinro Setoguchi, and Osamu Yaoka, both of Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 952,183, Oct. 17, 1978, abandoned. This application Apr. 14, 1980, Ser. No. 139,625

Int. Cl.[3] **C07D** *401/04;* **A61K** *31/50*

U.S. Cl. 544—114 **15 Claims**

1. A pyridazinone compound of the formula:



and a pharmaceutically acceptable acid addition salt thereof, wherein A is methylene, ethylene, C_{1-4} alkyl substituted ethylene, vinylene or C_{1-4} alkyl substituted vinylene; B=C< is O=C< or H_2C<; R^1 is hydrogen, C_{1-4} alkyl, C_{2-4} alkanoyl, C_{1-2} alkylsulfonyl, or mono- or di-substituted benzoyl each substituent being independently selected from the class consisting of halogen, C_{1-4} alkyl or C_{1-4} alkoxy; R^2 is hydrogen, alkyl, hydroxy C_{1-4} alkyl, C_{1-11} carbamoylalkyl, C_{1-2} naphthyloxyalkyl, C_{1-5} oxoalkyl or $(R^6)(R^7)N—(CH_2)_n—$, where each of R^6 and R^7 is hydrogen or C_{1-4} alkyl, or R^6 alkyl, or R^6 and R^7 together with the adjacent nitrogen atom form pyrrolidine, piperidine, morpholine, piperazine or N-methylpiperazine and n is 2 or 3; R^3 is hydrogen; R^4 is hydrogen, C_{1-4} alkyl, hydroxymethyl or C_{2-4} alkanoyloxymethyl; and R^5 is hydrogen or C_{1-4} alkyl; or R^3 and one of R^4 and R^5 together form a single bond.

4,258,186

PROCESS FOR THE PREPARATION OF BLOCKED POLYISOCYANATES

Ansgar Schott, Bochum; Rainer Gras, and Elmar Wolf, both of Herne, all of Fed. Rep. of Germany, assignors to Chemisch Werke Huls AG, Kreis Recklinghausen, Fed. Rep. of Germany

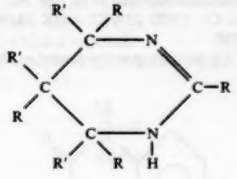
Filed Nov. 17, 1978, Ser. No. 961,562

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1977, 2751805

Int. Cl.[3] **C07D** *403/12*

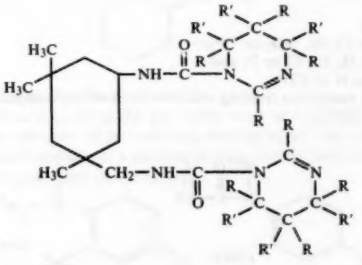
U.S. Cl. 544—253 **16 Claims**

1. In a process for the preparation of blocked polyisocyanates which comprises reacting a polyisocyanate with a blocking agent, the improvement wherein said blocking agent is a cyclic amidine of the formula:



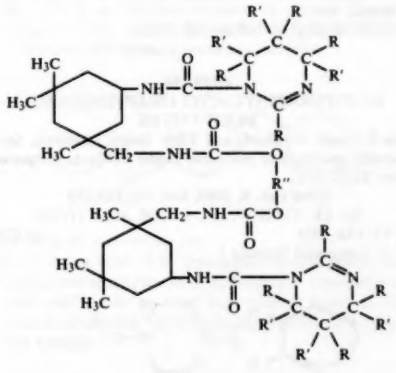
wherein R and R′ are the same or different substituents selected from the group consisting of hydrogen-, alkyl-, cycloalkyl-, benzyl and phenyl and wherein either R′ and R, or 2 R′ taken together form a cycloaliphatic ring, and wherein the reaction is carried out at temperatures of 0°–150° C.

8. A blocked polyisocyanate of the formula



wherein R and R′ are the same or different substituents selected from the group consisting of hydrogen-, alkyl-, cycloalkyl-, benzyl and phenyl and wherein either R′ and R or 2 R′ taken together form a cycloaliphatic ring.

9. A blocked polyisocyanate of the formula:



wherein R and R′ are the same or different substituents selected from the group consisting of hydrogen, alkyl, cycloalkyl, benzyl and phenyl and wherein either R′ and R or 2 R′ taken together form a cycloaliphatic ring, and R″ is an alkylene or cycloalkylene organic residue of a compound with 2 OH-groups which are reactive with isocyanate groups.

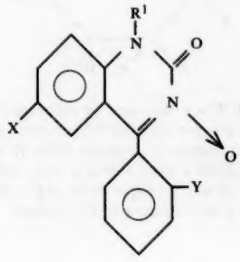
4,258,187

PROCESS FOR PREPARING QUINAZOLINONE OXIDES

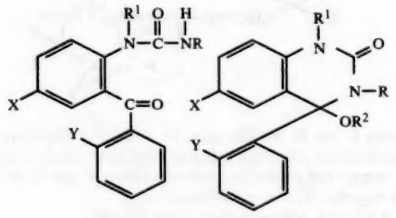
William J. Middleton, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 807,076, Jun. 16, 1977, abandoned.
This application Nov. 13, 1978, Ser. No. 959,626
Int. Cl.[3] C07D *239/82;* A61K *31/505*
U.S. Cl. 544—286 1 Claim

1. A process for preparing a compound of the formula:



where
X is Cl, Br, NO_2 or CF_3;
Y is H, Br, Cl or F; and
R^1 is H or CH_3;
which comprises treating either or both of the compounds of the formulae:



with an acid salt of hydroxylamine, where
R is hydrocarbyl or halohydrocarbyl of up to 8 carbon atoms, and
R^2 is H or alkyl or 1–6 carbon atoms.

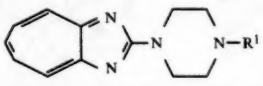
4,258,188

2-(1-PIPERAZINYL)-CYCLOHEPTIMIDAZOLE DERIVATIVES

Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,343
Int. Cl.[3] C07D *401/14, 403/04;* A61K *31/495*
U.S. Cl. 544—364 33 Claims

1. A compound formula I



(I)

in which R^1 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, hydroxy(lower)-alkyl, lower alkoxycarbonyl, formyl, phenyl(lower)alkyl, phenylcarbonyl, 2- or 3-furanylcarbonyl, phenyl, 2-or 3-pyridinyl, 1-oxo(lower)alkoxy(lower)alkyl, 2-imidazolinyl, aminoiminomethyl, aminothioxomethyl, (lower alkylamino)thioxomethyl, (phenylamino)thioxomethyl, hydrazinothiomethyl, (lower alkylthio)thioxomethyl, sodium thiothioxomethyl, α-halophenyl-α-phenylmethyl or phenyl substituted with one or two members selected from the group consisting of halo, lower alkyl, lower alkoxy or trifluoromethyl; or a therapeutically acceptable acid addition salt thereof.

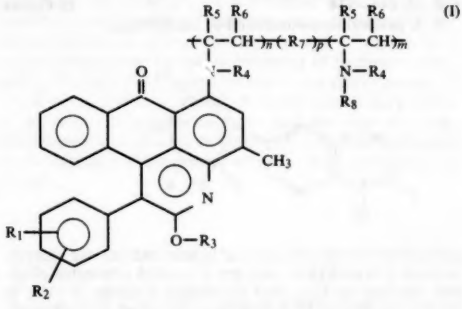
4,258,189

PROCESS FOR PREPARING ORANGE POLYMERIC COLORANTS

Patricia C. Wang, Shanghai, China; Robert E. Wingard, Jr., Palo Alto, and Leonard A. Bunes, San Carlos, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Continuation of Ser. No. 751,855, Dec. 17, 1976, abandoned.
This application Oct. 30, 1978, Ser. No. 956,304
Int. Cl.[3] C07D *221/15;* C09B *5/42*
U.S. Cl. 546—76 15 Claims

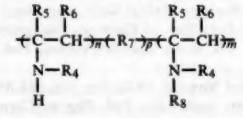
1. A process for preparing a polymeric orange colorant represented by the structural formula



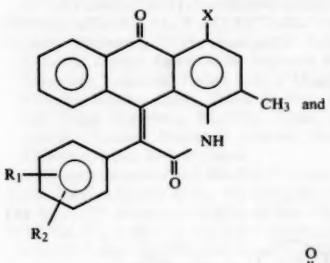
(I)

wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, alkyl of 1 through 3 carbon atoms, alkoxy of 1 through 3 carbon atoms, sulfonate, halogen, and nitro; R_3 is selected from among methyl, ethyl and the alkali metal salts of n-propyl sulfonate; R_4, R_5 and R_6 are independently selected drom the group consisting of hydrogen, methyl and ethyl; R_7 is selected from the group consisting of ethylene, ethylene sulfonate, ethylene phosphonate, ethylene phosphamate, ethylene sulfamate, acrylate and methacrylate; R_8 is hydrogen or acetyl; n is 10 to 2000; m is 0.3n to 5n; and p is 0 to 2(n+m), which process comprises the steps of

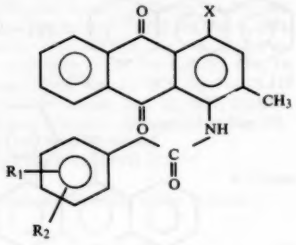
(a) contacting an amine group containing polymer represented by the formula



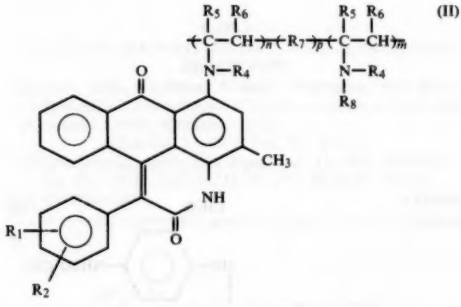
wherein R_4, R_5, R_6, R_7, m, n, and p are as previously defined and R_8 is hydrogen with an anthraquinone selected from those of the group represented by the formulae



and



wherein R_1 and R_2 are as previously defined and X is bromo, chloro or iodo in the liquid phase in the presence of a catalytically effective amount of a copper catalyst selected from among copper metal, copper salts and copper oxides and at least one mole of a strong, inorganic base selected from among KOH and NaOH per mole of said anthraquinone at a temperature of about 60° C. to about 200° C. for about 0.2 to about 24 hours to form a polymeric red colorant represented by the formula



(II)

wherein R_1, R_2, R_4, R_5, R_6, R_7, m, n and p are as previously defined and R_8 is hydrogen,

(b) Optionally reacting the product of step (a) with an acetylating agent to form red polymeric dye of formula (II) wherein R_1, R_2, R_4, R_5, R_6, R_7, m, n and p are as previously defined and R_8 is acetyl,

(c) Reacting the product of step (a) or (b) in aqueous liquid phase with inorganic base selected from among alkali metal carbonates and hydroxides,

(d) Reacting the product from step (c) in an aqueous reaction medium selected from among water and water containing up to 25% of a water-miscible organic with an agent to form a polymeric colorant represented by formula (I) wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, m, n and p are previously defined, said agent selected from the group consisting of dimethylsulfate, diethylsulfate, and propane sultone, so as to provide group R_3 in Formula I, as previously defined.

4,258,190

PREPARATION OF ACRIDINONES

Arthur J. Taggi, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 29, 1979, Ser. No. 70,834

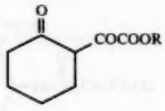
Int. Cl.[3] **C07D** *219/04*

U.S. Cl. 546—103 **18 Claims**

7. A process which comprises

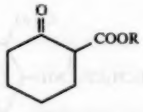
(a) reacting a solution of cyclohexanone and oxalate ester of the formula

where R is an alkyl group of 1–4 carbon atoms at from −20° C. to 60° C. in the presence of an alkali metal alkoxide and a solvent and then hydrolyzing the reaction product with an aqueous acid to form a 2-cyclohexanoneglyoxylate ester of the formula



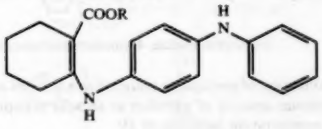
wherein R is as above; and

(b) decarbonylating the glyoxylate ester at 110°–200° C. in the presence of an inert high boiling liquid with the optional addition of a catalyst to form 2-cyclohexanonecarboxylate ester of the formula



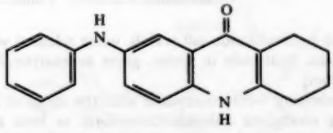
wherein R is as above

(c) condensing the cyclohexanonecarboxylate ester with N-phenyl p-phenylenediamine in the presence of a catalytic amount of a strong acid at a temperature of from 80°–150° C. at sufficient pressure to remove byproduct water to form a 2-{4'-[(phenyl)amino]phenyl}aminocyclohexenecarboxylate ester of the formula



wherein R is as above; and

(d) cyclizing the 2-{4'-[(phenyl)amino]phenyl}aminocyclohexenecarboxylate ester by heating at a temperature of 180°–300° C. in an inert high boiling liquid to obtain 1,2,3,4-tetrahydro-7-(phenyl)amino-9(10H)acridinone of the formula



4,258,191

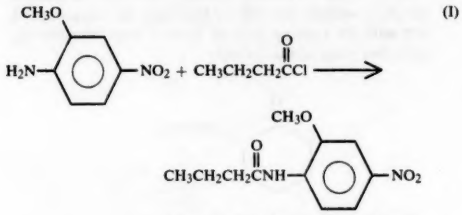
MULTI-STEP PROCESS FOR THE PRODUCTION OF METHANESULFON-M-ANISIDIDE, 4'-(9-ACRIDINYLAMINO)-

Henryk Dubicki, Lancaster; Jack L. Parsons, East Aurora, and Fred W. Starks, Kenmore, all of N.Y., assignors to The United States of America as represented by the Secretary of Health, Education and Welfare, Washington, D.C.

Filed Mar. 29, 1979, Ser. No. 25,157
Int. Cl.[3] C07D *219/10*; A61K *31/47*
U.S. Cl. 546—106 6 Claims

1. A process for the production of methanesulfon-m-anisidide, 4'-(9-acridinylamino)-, acetate (NSC 249992) consisting essentially of

(a) the isolation of I

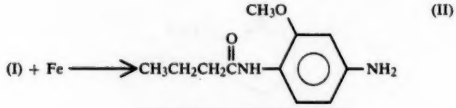


(I)

4-Butyrylamino-3-methoxy-nitrobenzene

by precipitation in water, then purification by washing in water, 2% aqueous HCl, and ethanol;

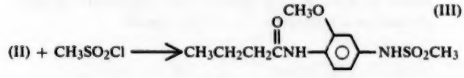
(b) the purification of II



(II)

4-Butyrylamino-3-methoxy-aniline

by dissolving in methylene chloride, clarifying by filtration, and then proceeding directly to step (c);

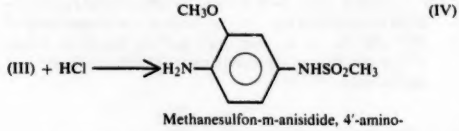


(III)

o-Butyroanisidide, 4'-(methanesulfonamido)-

the utilization of methylene chloride as a solvent and using a minimum amount of pyridine as an acid acceptor;

(d) the precipitation isolation of IV

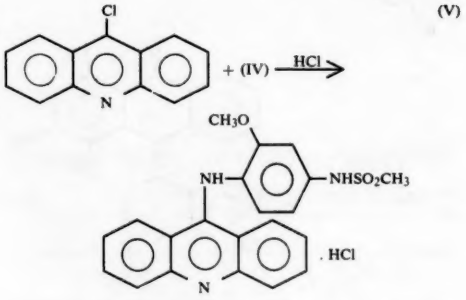


(IV)

Methanesulfon-m-anisidide, 4'-amino-

as the hydrochloride salt which, when released with ammonium hydroxide in water, gives an analytically pure product;

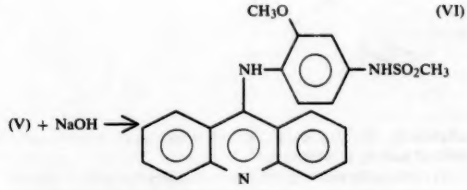
(e) condensing 9-chloro-acridine with the amine at 55°–60° using methylene chloride/chloroform as both reaction cosolvents and also as a wash for the product V



(V)

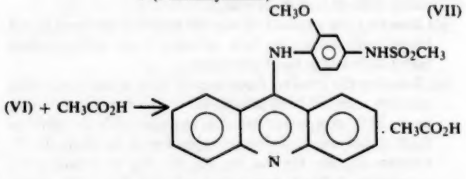
Methanesulfon-m-anisidide, 4'-(9-acridinylamino)-, monohydrochloride

(f) neutralizing the hydrochloride in DMAC with aqueous sodium hydroxide at about 40°–55° C. to produce a filterable precipitate, said precipitate being recrystallized in DMF/water at 70°–80° C. to produce an increasedly filterable precipitate VI



(VI)

Methanesulfon-m-anisidide, 4'-(9-acridinylamino)-



(VII)

Methanesulfon-m-anisidide, 4'-(9-acridinylamino)-, acetate

4,258,192

N^2-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-18, Asahigaoka 3-chome, Tarumi-ku, Kobe-shi, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto; Yoshikuni Tamao, both of Machida, Japan; Kazuo Ohkubo, Komae, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Machida, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, and Shosuke Okamoto, Kobe, both of Japan

Continuation-in-part of Ser. No. 938,711, Aug. 31, 1978, which is a continuation-in-part of Ser. No. 844,188, Oct. 21, 1977, Pat. No. 4,117,127, which is a division of Ser. No. 760,745, Jan. 19, 1977, Pat. No. 4,066,773, which is a continuation-in-part of Ser. No. 653,217, Jan. 28, 1976, Pat. No. 4,055,651, Ser. No. 713,486, Aug. 11, 1976, Pat. No. 4,073,914, Ser. No. 703,704, Jul. 8, 1976, Pat. No. 4,069,323, and Ser. No. 671,436, Mar. 29, 1976, Pat. No. 4,066,758, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application May 22, 1979, Ser. No. 41,419

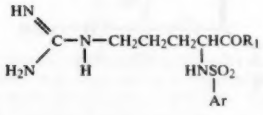
Claims priority, application Canada, Dec. 16, 1977, 293199

The portion of the term of this patent subsequent to Sep. 19, 1995, has been disclaimed.

Int. Cl.[3] A61K *31/47;* C07D *215/36*

U.S. Cl. 546—166 8 Claims

1. An N^2-arylsulfonyl-L-argininamide of the formula (I):



(I)

wherein R is (2R,4R)-4-alkyl-2-carboxy-1-piperidino said alkyl being C_1–C_5 alkyl; and Ar is 1,2,3,4-tetrahydro-8-quinolyl optionally substituted with at least one C_1–C_3 alkyl.

4,258,193

DISULFIDE DERIVATIVES HAVING S—S EXCHANGE REACTIVITY

Tadashiro Fujii, Mishima; Nobuaki Nakagawa, and Kikuo Kotani, both of Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

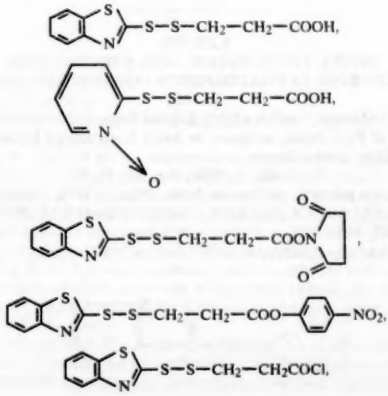
Filed Jul. 13, 1979, Ser. No. 57,502

Claims priority, application Japan, Jul. 13, 1978, 53-85900

Int. Cl.[3] C07D *405/12, 211/72, 277/78;* C07C *103/52*

U.S. Cl. 546—281 4 Claims

1. A disulfide derivative selected from the group consisting of



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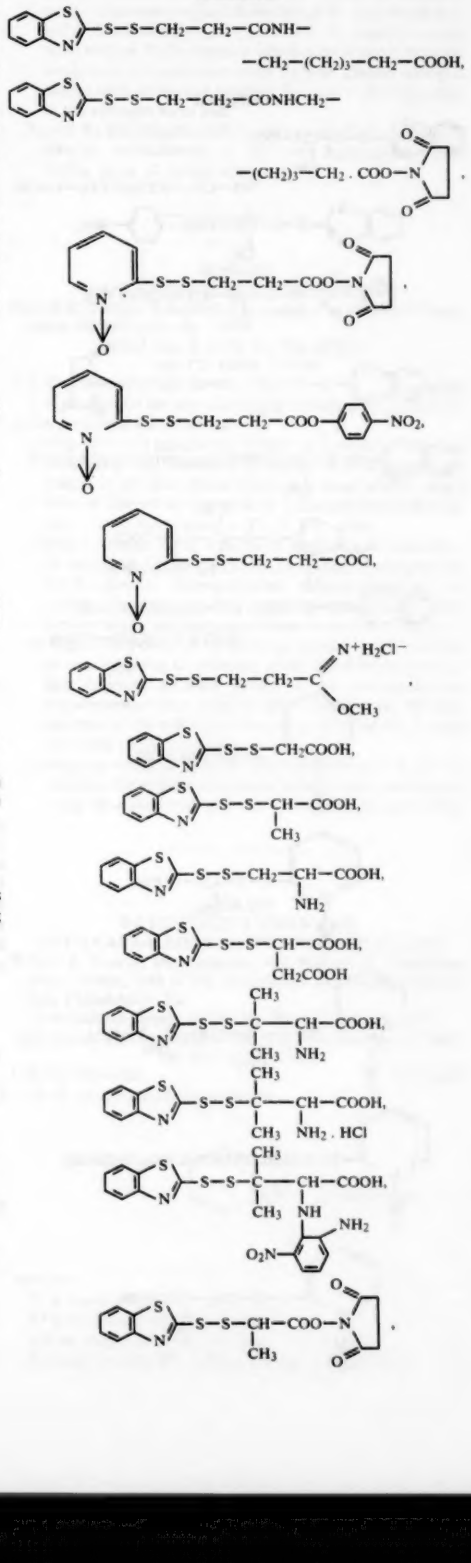

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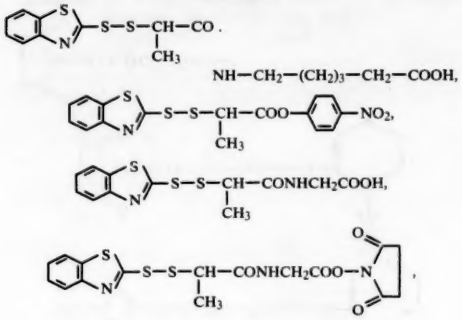

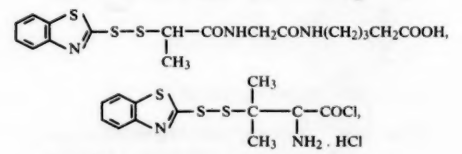

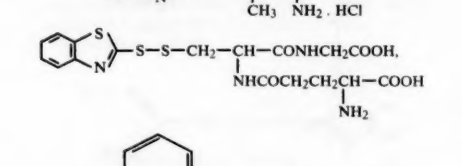

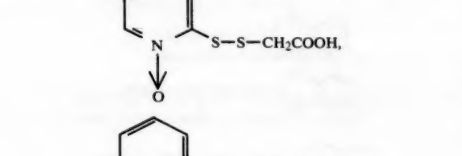

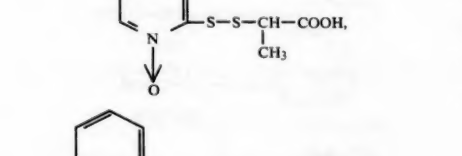

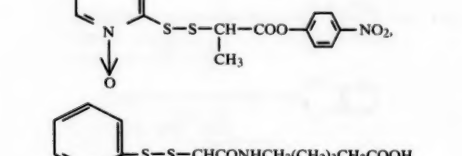

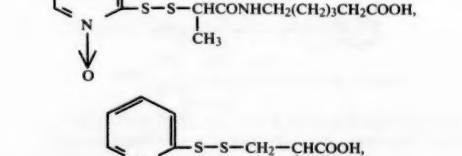

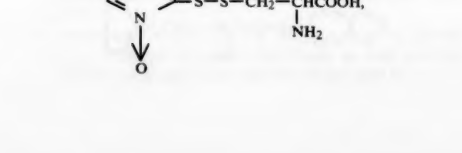

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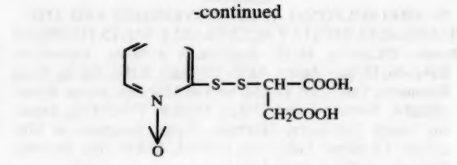
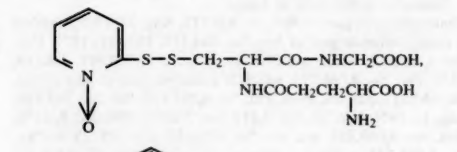
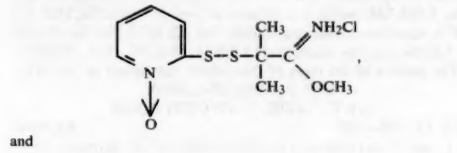
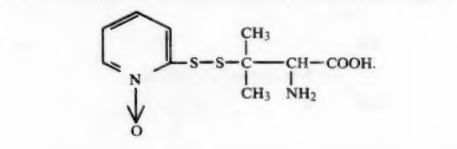






and



4,258,194

PROCESS FOR PRODUCING 2,3,5-TRICHLOROPYRIDINE

Claus D. Weis, Pfeffingen, and Peter Sutter, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 10, 1979, Ser. No. 74,216
Int. Cl.[3] C07D *213/02*
U.S. Cl. 546—345 **11 Claims**

1. A process for producing 2,3,5-trichloropyridine, which process comprises reacting 2,3,4,5-tetrachloropyridine, in an alkanephosphonic acid dialkyl ester having 1 to 4 carbon atoms in each of the alkyl groups or in a phosphoric acid trialkyl ester having 1 to 4 carbon atoms in each of the alkyl groups as the solvent, at 60°–120° C., in the presence of 1.4 to 2.8 mols, per mol of 2,3,4,5-tetrachloropyridine, of an ammonium salt of an inorganic or organic acid, with 1.2 to 1.6 gram atoms of zinc per mol of 2,3,4,5-tetrachloropyridine.

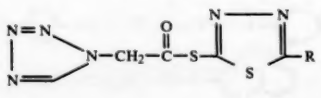
4,258,195

NOVEL THIOL ESTERS AND PROCESS FOR PREPARING CEPHALOSPORIN COMPOUNDS USING SAME

Chisei Shibuya; Kunihiko Ishii; Takumi Sano, and Torao Ishida, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 8, 1979, Ser. No. 18,755
Claims priority, application Japan, Mar. 9, 1978, 53/25975
Int. Cl.[3] A01N *43/82;* **A61K** *31/425;* **C07D** *417/12, 501/56*
U.S. Cl. 548—136 **3 Claims**

1. An 1,3,4-thiadiazole-5-thiol ester of the formula,



wherein R is a hydrogen atom or a methyl group.

4,258,196

PROCESS FOR THE PRODUCTION OF TERTIARY 2-HALOACETAMIDES

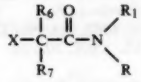
John P. Chupp, and Richard D. Goodin, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 896,879, Apr. 17, 1978, abandoned. This application Aug. 2, 1979, Ser. No. 63,005

Int. Cl.[3] **C07C** *102/00;* **C07D** *277/62*

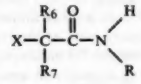
U.S. Cl. 548—165 **75 Claims**

1. Process for the preparation of 2-haloacetamides having the formula



I

which comprises converting a secondary 2-haloacetamide of the formula



II

to an anion thereof under basic conditions by means of electrolysis or reaction with metal hydrides, fluorides, oxides, hydroxides, carbonates, phosphates, or alkoxides and reacting said anion with a compound of the formula

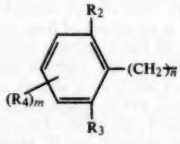
$$R_1X^1 \qquad \text{(III)}$$

or a (1,4-)Michael addition reagent wherein in the above formulae:

X is chlorine, bromine or iodine;

X^1 is chlorine, bromine, iodine or a halogen equivalent;

R is hydrogen, C_{1-18} alkyl, C_{2-18} alkenyl, alkynyl or alkoxyalkyl, polyalkoxyalkyl, C_{3-7} cycloalkyl or cycloalkylalkyl, C_{5-7} cycloalkenyl or cycloalkadienyl which may be substituted with C_{1-6} alkyl groups; saturated or unsaturated heterocyclic radicals having up to 6 ring atoms containing O, $S(O)_a$ and/or $N(R_5)_b$ groups; or a radical of the formula



IV

wherein

a is 0–2 inclusive;

b and n are 0 or 1;

m is 0–3 inclusive when R_2 and R_3 are other than hydrogen and 0–5 otherwise.

R_2, R_3, R_4 and R_5 are independently hydrogen, C_{1-6} alkyl, alkoxy, polyalkoxy or alkoxyalkyl, C_{2-6} alkenyl, alkenyloxy, alkynyl or alkynyloxy, C_{6-10} aryl, aryloxy, aralkyl or aralkyloxy, NO_2, halogen, CF_3, $(CH_3)_3Si$-, saturated or unsaturated heterocyclic radical having up to 6 ring atoms containing O, $S(O)_a$ and/or $N(R_5)_b$ groups or R_2, R_3 or R_4 when combined with the phenyl radical to which attached may form a C_{6-10} aryl radical; or, when not a hydrogen atom, the R group may be substituted with an R_2-R_5 group;

R_1 is C_{1-18} alkyl, C_{3-18} alkenyl or alkynyl, C_{2-18} alkoxyalkyl, C_{3-7} cycloalkyl or cycloalkylalkyl, C_{6-10} aralkyl, alkylthiomethyl, cyanomethyl, loweracyloxymethyl, loweralkylthiocarbomethyl, substituted or unsubstituted carbamoylmethyl, benzothiazolinonylmethyl, phthalimidomethyl, mono- or di-loweracylamidomethyl or C_{1-10} hydrocarbylsulfonylamidomethyl groups or said R_1 member substituted with an R_2-R_5 member which is inert under reaction conditions, provided that when R_1 is an alkenyl radical it cannot have an olefinic bond on the carbon atom attached to the nitrogen atom and

R_6 and R_7 are independently hydrogen or alkyl, cycloalkyl, alkenyl, cycloalkenyl, or aromatic hydrocarbon each having up to 12 carbon atoms.

4,258,197

MANUFACTURE OF SULFENAMIDES

Sameeh S. Toukan, Schuylkill, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 8, 1979, Ser. No. 47,176

Int. Cl.[3] **C07D** *277/80*

U.S. Cl. 548—167 **5 Claims**

1. A process for the manufacture of 2-benzothiazole-sulfenamides consisting essentially of:

adding 10 to 30 percent by weight of a member selected from the group consisting of water, 20 to 60 percent by weight of ethylene glycol monoalkyl ether solvent, and a mixture thereof to one mole of 2-mercaptobenzathiazole and cooling the mixture to 8°–12° C.;

adding dropwise 1.5 to 4 moles of a primary or secondary amine selected from the group consisting of morpholine, tert-butylamine, isopropylamine, diisopropylamine and cyclohexylamine to the mercaptobenzothiazole-water mixture while maintaining a temperature below 20° C.;

adding 1.5 to 2 moles of an oxidizing agent selected from the group consisting of chlorine, alkali metal hypochlorites, and hydrogen peroxide slowly to the mercaptobenzothiazoleamine-water mixture while maintaining the temperature of the solution in the range of 25° to 60° C. until the oxidation is completed;

cooling the oxidized reaction mixture to about 5° to 15° C. whereby the sulfenamide product precipitates; and recovering the sulfenamide product in substantially pure form.

4,258,198

5-CYCLOALKYL THIO- AND OXY-2-CARBALKOXYAMINOBENZIMIDAZOLES

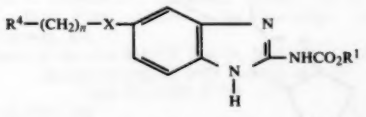
Robert J. Gyurik, Downingtown, and William D. Kingsbury, West Chester, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 364,841, May 29, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,207

Int. Cl.[3] **C07D** *235/32*

U.S. Cl. 548—306 **13 Claims**

10. A compound of the structure



wherein:

R^1 is lower alkyl;

R^4 is cycloalkyl of 3–6 carbons;

n is an integer of from 0–5; and

X is oxy or thio, R^4—$(CH_2)_n$ having 3–8 carbons.

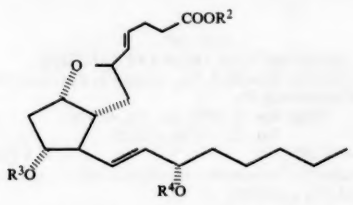
4,258,199

METHOD FOR PREPARING CYCLIC ETHERS AND THIOETHERS INCLUDING OXYGEN ISOMERS AND SULFUR ANALOGS OF PROSTACYCLIN

Kyriacos C. Nicolaou, Philadelphia; William E. Barnette, Levittown, both of Pa.; Ronald L. Magolda, Vineland, N.J., and Zenon Lysenko, Philadelphia, Pa., assignors to Research Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,143
Int. Cl.³ C07D *333/78, 307/93*
U.S. Cl. 549—51 **26 Claims**

1. A method of preparing a prostacyclin derivative of the formula (1):

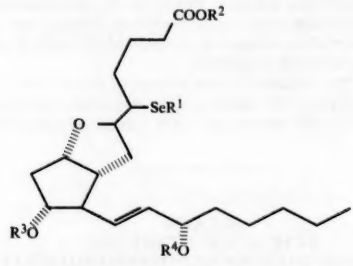


(1)

wherein R^2 is any pharmaceutically acceptable cation or lower alkyl group having 1 to 4 carbon atoms, R^3 and R^4 are hydrogen or acid-labile or base-labile hydroxy protecting groups; which comprises:

cyclizing a $PGF_{2\alpha}$ prostaglandin derivative with a selenenyl halide of the formula R^1Se-halide wherein R^1 is selected from the group consisting of phenyl, lower alkyl and alkyl substituted phenyl;

wherein the molar ratio of said selenenyl halide to said $PGF_{2\alpha}$ derivative is 0.9–1.5 to 1, thereby obtaining a selenoether intermediate of the formula (2):

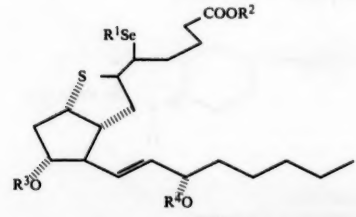


(2)

reacting said selenoether intermediate (2) with an oxidizing agent; and

when R^3 and R^4 are different than hydrogen, removing said protecting groups R^3 and R^4 in acid or base.

9. A method of preparing a selenoether intermediate of formula (I):



(I)

wherein R^1 is selected from the group consisting of phenyl, lower alkyl, and alkyl substituted phenyl, R^2 is any pharmaceutically acceptable cation or lower alkyl group having 1 to 4 carbon atoms, and R^3 and R^4 are hydrogen or acid-labile or base-labile hydroxy protecting groups, which comprises:

cyclizing a material selected from the group consisting of a 9α-thio analogue of a $PGF_{2\alpha}$ prostaglandin derivative or a 9α-thioester analogue thereof, with a selenenyl halide of formula R^1Se halide, wherein the molar ratio of said selenenyl halide to said prostaglandin analogue is 0.9 to 1.5–1.

4,258,200

PRODUCTION OF CARBOXYLIC ACID AMIDES AND CARBAMATES USING COBALT CATALYSTS

Randall J. Daughenbaugh, Barto, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 11, 1980, Ser. No. 129,453
Int. Cl.³ C07C *102/06*
U.S. Cl. 560—24 **15 Claims**

1. In a process for producing a (1) carboxylic acid amide by reacting a carboxylic acid ester of a fatty acid of 1 to 12 carbon atoms and an alcohol of 1 to 12 carbon atoms with an amine selected from the group consisting of primary and secondary amines of 1 to 12 carbon atoms or (2) a carbamate by reacting a $C_{1\text{-}12}$ diester of carbonic acid with an amine selected from the group consisting of primary and secondry amines of 1–12 carbon atoms, the improvement for enhancing the reaction rate which comprises including a catalytic amount of an organo cobalt catalyst where the cobalt is in its +2 valence state.

4,258,201

PROCESS FOR THE MANUFACTURE OF CARBAMATES

David Moy, Ridgewood, N.J., assignor to Halcon Research and Development Corp., New York, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,104
Int. Cl.³ C07C *125/063, 125/07*
U.S. Cl. 560—24 **37 Claims**

1. A process for producing carbamates from a reactant consisting essentially of an organic primary or secondary amine which is free of substitution by OH—, >C=O or sulfonic acid groups and which comprises a member selected from the group consisting of aliphatic amines, alicyclic amines and aromatic amines having the formula

(i) RNH_2,

(ii) RNH(R'), or

(iii) $R(NH_2)_m$

wherein R and R' are independently selected from a group consisting of alkyl, aryl, alkaryl, aralkyl, and cycloalkyl and wherein "m" is an integer of from 2 to 5, and substituted derivatives of the foregoing groups wherein the substituent is inert and is a member selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, cycloalkyl, halogen, cyano, tertiary amino, ether and thioether, and amino-substituted derivatives of the foregoing hydrocarbon substituents to the R and R' groups, said process comprising contacting said amine reactant in a reaction zone under substantially anhydrous conditions with (1) a source of carbon monoxide, (2) an organic compound which contains at least one hydroxyl group per molecule and which comprises a member selected from the group consisting of monohydric and polyhydric compounds of the formula $Z(OH)_n$, wherein "n" is an integer of at least one and "Z" is an aromatic, aliphatic, cycloaliphatic or araliphatic group or a substituted derivative of any of the foregoing groups wherein the substituent comprises members selected from the group consisting of sulfoxide, amine, sulfone and carboxylic ester groups, and (3) a member selected from the group consisting of elemental sulfur, elemental selenium, elemental tellurium, sulfur compounds, selenium compounds and tellurium compounds, in the substantial absence of reactive oxygen and in the presence of an effective amount of a catalyst selected from the group consisting of non-halide compounds

and complexes of metals of Groups IVB, VB, VIB, VIIB, VIII, IB and IIIA of the Periodic Table to form the carbamate corresponding to said amine reactant and said hydroxyl-containing organic compound.

4,258,202

CYCLOPROPANECARBOXYLIC ACIDS AND ESTERS

Paolo Piccardi; Francesco Corda, both of Milan; Franco Gozzo, San Giuliano Milanese, and Augusto Menconi, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

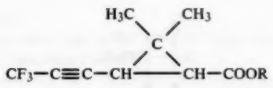
Filed Feb. 26, 1979, Ser. No. 15,104

Claims priority, application Italy, Feb. 28, 1978, 20714 A/78; Dec. 12, 1978, 31310 A/78

Int. Cl.³ C07C *69/743*

U.S. Cl. 560—124 **3 Claims**

1. A compound having the formula:



wherein R is selected from the group consisting of H and C_2H_5.

4,258,203

PREPARATION OF BUTANEDICARBOXYLIC ACID ESTERS

Rolf Platz, Mannheim; Rudolf Kummer, Frankenthal, and Heinz-Walter Schneider, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 19, 1979, Ser. No. 58,944

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1978, 2836518

Int. Cl.³ C07C *67/38*

U.S. Cl. 560—204 **6 Claims**

1. In a process for the preparation of butanedicarboxylic acid esters, wherein

(a) an aqueous cobalt salt solution is treated, at from 50° to 200° C. and under a pressure of from 50 to 500 bar, with excess carbon monoxide and hydrogen in the presence of active charcoal laden with cobalt carbonyl,

(b) the resulting aqueous solution of cobalt carbonyl hydride is extracted with butadiene, or with a hydrocarbon mixture containing butadiene, and the aqueous phase is separated off,

(c) the butadiene, or the butadiene/hydrocarbon mixture, containing cobalt carbonyl hydride, cobalt carbonyl and butenyl-cobalt tricarbonyl, is reacted with carbon monoxide and a C_1–C_4-alkanol in excess in the presence of from 0.5 to 2 moles, per mole of butadiene, of a tertiary nitrogen base having a pK_a of from 3 to 11, at from 80° to 150° C. and under a pressure of from 300 to 2,000 bar,

(d) the tertiary nitrogen base contained in the resulting reaction mixture is removed until its content reaches 0.1–0.3 mole per mole of pentenoic acid ester, excess hydrocarbons are also removed, the pentenoic acid ester remaining in the reaction mixture is reacted with carbon monoxide and C_1–C_4-alkanol in excess at from 140° to 200° C. and under a pressure of from 100 to 400 bar in the presence of the amounts of cobalt carbonyl and tertiary nitrogen base present in the reaction mixture, and excess alkanol and free nitrogen base are then distilled off, and

(e) the reaction mixture which is left and which contains a cobalt catalyst, butanedicarboxylic acid ester and by-products is treated with oxidizing agents in the presence of the aqueous acid solution which has been removed in stage (b), and the mixture is separated into an organic phase, from which butanedicarboxylic acid ester is isolated by distillation, and an aqueous phase, containing cobalt salts, which is recycled to stage (a), the improvement wherein at least 5% by volume of the aqueous phase which has been separated off in stage (b) is heated at from 250° to 350° C. under superatmospheric pressure, before said aqueous phase is used in stage (e), for a period of time sufficient to decompose methyl adipate, adipic acid and nitrogen bases which have accumulated in the aqueous phase.

4,258,204

ACRYLATE ESTER MONOMER PRODUCTION

Allen R. Banks, Lakewood; Richard F. Fibiger, Boulder, and Ted Jones, Lakewood, all of Colo., assignors to University Patents, Inc., Norwalk, Conn.

Filed Nov. 24, 1978, Ser. No. 963,272

Int. Cl.³ C07C *69/52*

U.S. Cl. 560—205 **9 Claims**

1. In a process for producing acrylate ester monomers by mixing and reacting the corresponding α,β-unsaturated organic acid halide and a hydroxyl containing organic compound in an organic solvent for the reactants, the improvement which consists of carrying out the reaction in the presence of molecular sieves in the range of about 2 A° to about 4 A° and in an amount sufficient to substantially avoid the production of polymers, whereby substantially pure α,β-unsaturated ester monomers are produced in yields of 50% or greater, based on the starting materials, and without any substantial polymer production.

4,258,205

2,2-DIMETHYLCYCLOPROPANECARBALDEHYDE DIMETHYL ACETAL DERIVATIVES

Johannes Van Berkel, and Hendrik C. Kelderman, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

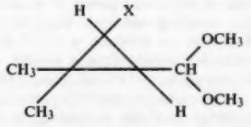
Filed Dec. 4, 1978, Ser. No. 965,951

Claims priority, application United Kingdom, Dec. 16, 1977, 52463/77; Dec. 16, 1977, 52464/77; Dec. 16, 1977, 52465/77

Int. Cl.³ C07C *43/315, 47/37, 69/14*

U.S. Cl. 560—231 **4 Claims**

1. A compound of the formula



wherein X is —CH_2OH, —CHO or —$CH_2OC(O)CH_3$ in the cis isomer form.

4,258,206

SELECTIVE CARBONYLATION OF OLEFINS BY A POLYMER-SUPPORTED PD HALIDE CATALYST

Charles U. Pittman, Jr., Tuscaloosa, Ala., and Quock Y. Ng, Lake Elmo, Minn., assignors to The University of Alabama, University, Ala.

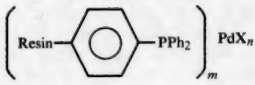
Division of Ser. No. 941,077, Sep. 11, 1978, abandoned. This application Jul. 16, 1979, Ser. No. 57,819

Int. Cl.³ C07C *67/38, 51/14*

U.S. Cl. 560—233 **24 Claims**

1. A method for the carbonylation of α-olefins which comprises:

reacting at 70°–200° C. an olefin having 2–30 carbon atoms with carbon monoxide at a pressure of 25–2500 psi, with a primary alcohol or water, or a mixture thereof, and with a catalyst represented by the formula:



wherein

Resin-represents a non-degradable cross-linked swollen high molecular weight resin with permeatable micropores;

the sum of m and n is 4; X is a halide and wherein said α-olefin and said alcohol are capable of permeating the micropores of said swollen resin.

4,258,207

CYCLOPROPANECARBOXYLATE PESTICIDES PREPARATION

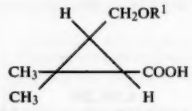
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 953,987, Oct. 23, 1978, abandoned. This application Mar. 15, 1979, Ser. No. 20,608

Int. Cl.[3] **C07C** *51/16, 67/28*

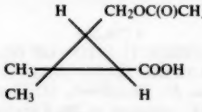
U.S. Cl. 560—238 **3 Claims**

1. A process for the preparation of a compound of the formula



wherein R^1 is an optionally halo-substituted hydrocarbyl group which process comprises ozonolysis of (+)-Δ^3-carene and treatment with dimethyl sulfide in methanol to yield (1-(2,2-dimethoxyethyl)-2,2-dimethyl-3-(2-oxopropyl)cyclopropane, oxidation of the acetal derivative with hydrogen peroxide or a peracid to (2-(2,2-dimethoxyethyl)-3,3-dimethylcyclopropyl)methyl acetate, hydrolysis of the acetate derivative to 2,2-dimethyl-3-(2,2-dimethoxyethyl)cyclopropyl)methanol, hydrocarbylation with an optionally halo-substituted hydrocarbyl halide, R^1Hal wherein Hal is chlorine, bromine or iodine, to introduce the hydrocarbyl R^1 substituent described above, hydrolysis of the acetal group to an aldehyde group, treatment of the resulting aldehyde derivative with acetic anhydride and a base to produce a 2-(2,2-dimethyl-3-(hydrocarbyloxymethyl)cyclopropyl)vinyl acetate, ozonolysis of the vinyl acetate derivative and treatment with zinc to produce 2,2-dimethyl-3-(hydrocarbyloxymethyl)cyclopropanecarbaldehyde and oxidation of the carbaldehyde to the desired acid product of the above formula.

3. A process for the preparation of a compound of the formula



which process comprises ozonolysis of (+)-Δ^3-carene and treatment with dimethyl sulfide in methanol to yield 1-(2,2-dimethoxyethyl)-2,2-dimethyl-3-(2-oxopropyl)cyclopropane, oxidation of the acetal derivative with hydrogen peroxide or a peracid to (2-(2,2-dimethoxyethyl)-3,3-dimethylcyclopropyl)-methyl acetate, hydrolysis of the acetate derivative to (2,2-dimethyl-3-(2-oxoethyl)cyclopropyl)methyl acetate, treatment of the product with acetic acid anhydride and a base to form 2-(3-acetoxymethyl-2,2-dimethylcyclopropyl)-vinyl acetate, ozonolysis of the vinyl acetate derivative and treatment with zinc to yield 3-acetoxymethyl-2,2-dimethylcyclopropanecarbaldehyde and oxidation of the carbaldehyde to yield the desired acid product of the above formula.

4,258,208

PREPARATION OF ESTERS FROM ORGANIC BROMO ALKYL TELLURIUM COMPOUNDS

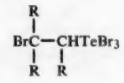
Jar-lin Kao, and Ming N. Sheng, both of Cherry Hill, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 23, 1979, Ser. No. 59,730

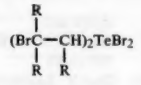
Int. Cl.[3] **C07C** *67/00, 69/14, 69/24*

U.S. Cl. 560—266 **6 Claims**

1. A process for the preparation of 2-bromoalkyl esters which comprises thermally decomposing, at a temperature in the range of from about 100° C. to 200° C., an organic bromo alkyltellurium compound selected from 2-bromoalkyltellurium tribromide having the formula



and bis(2-bromoalkyl)tellurium dibromide having the formula



or mixtures thereof, wherein R is hydrogen or a methyl group, at least one R being hydrogen, in the presence of a lower aliphatic monocarboxylic acid selected from the group consisting of formic, acetic, propionic, butyric and isobutyric acid and in the absence of oxygen or an oxygen-containing gas and recovering the desired ester.

4,258,209

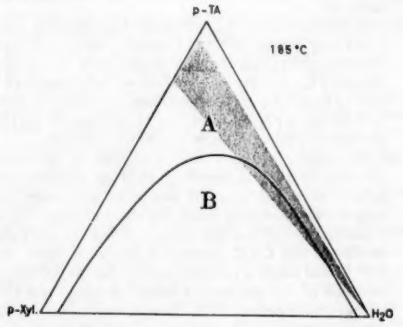
PROCESS FOR PREPARING TEREPHTHALIC ACID

Jacques D. V. Hanotier, Saint-Lambert, Belgium, assignor to Labofina S.A., Brussels, Belgium

Continuation of Ser. No. 947,641, Oct. 2, 1978, abandoned. This application Aug. 22, 1979, Ser. No. 68,648

Int. Cl.[3] **C07C** *51/255*

U.S. Cl. 562—412 **16 Claims**



1. A process for preparing terephthalic acid which comprises the steps of:

(a) oxidizing a substantially homogeneous aqueous liquid reaction mixture comprising

at least one oxidizable terephthalic acid precursor selected from the group consisting of p-toluic acid, and mixtures of p-toluic acid and an oxidizable compound selected

from the group of p-xylene, partially oxidized p-xylene derivatives, and mixtures thereof,

an amount of at least 5% by weight of water which is sufficient to obtain a workable slurry,

an amount of an oxidation catalyst comprising at least one catalytically-active metal compound selected from the group consisting of manganese compounds, cobalt compounds, and mixtures thereof which is sufficient to provide an amount of catalytically-active compound between a minimum amount of M millimoles of the catalytically-active metal compound per kg of the liquid reaction mixture, wherein M is defined by the following equation

$$M = \frac{y(x + A) + Bx}{Cx + D}$$

wherein

y represents the molar ratio of water/p-toluic acid in the reaction mixture,

x represents the molar ratio of manganese/total amount of manganese+cobalt in the catalyst composition, i.e., Mn/(Mn+Co)

A equals about 0.002,

B equals about 10.9,

C equals about 4.35, and

D equals about 0.0724,

and a maximum of about 40 millimoles of catalytically-active compound per kg of the reaction mixture, with a molecular oxygen-containing gas at a reaction temperature of from about 140° C. to about 220° C. and at a pressure sufficient to maintain at least part of the water in the liquid phase at the reaction temperature; and

(b) recovering an oxidized mixture containing the terephthalic acid.

4,258,210

PROCESS FOR MANUFACTURING SODIUM PANTOTHENATE

Dieter Bartoldus, Riehen, and Emil Broger, Magden, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 8, 1979, Ser. No. 37,166

Claims priority, application Switzerland, May 18, 1978, 5387/78

Int. Cl.³ C07C *102/06, 99/10*

U.S. Cl. 562—569 **14 Claims**

1. In a process for producing crystalline sodium D-pantothenate from beta-aminopropionitrile, wherein beta-aminopropionitrile is saponified with aqueous caustic soda to produce a sodium alaninate solution, dry sodium alaninate is obtained from the solution, the dry sodium alaninate is dissolved in a lower alkanol solvent and reacted with pantolactone to give crystalline sodium D-pantothenate, the improvement comprising obtaining the dry sodium alaninate from said solution by:

(a) drying said sodium alaninate solution in a pre-evaporator to produce sodium alaninate having a water content of about 5 to about 10% by weight; and

(b) thereafter, further drying said sodium alaninate at a temperature of about 140° C. to about 60° C. in a thin-layer evaporator to a water content of at most about 1% by weight.

4,258,211

4-AMINOALIPHATIC-2,3,5,6-[DIBENZOBICYCLO[5.1.-0]OCTANES] AND SALTS THEREOF

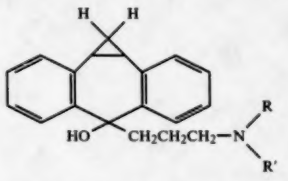
Edward L. Engelhardt, Gwynedd Valley, and David C. Remy, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 93,494, Nov. 27, 1970, abandoned, and Ser. No. 59,671, Jul. 30, 1970, abandoned, which is a continuation-in-part of Ser. No. 662,882, Aug. 24, 1967, abandoned, said Ser. No. 93,494, is a continuation-in-part of Ser. No. 834,601, Jun. 9, 1969, abandoned, which is a continuation of Ser. No. 662,881, Aug. 24, 1967, abandoned. This application Nov. 28, 1972, Ser. No. 310,188

Int. Cl.³ C07C *87/28*

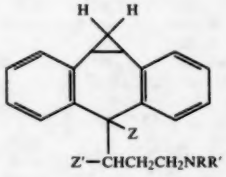
U.S. Cl. 564—379 **16 Claims**

1. A compound of the formula



wherein —NRR′ is di(lower alkyl) amino.

2. A compound of the formula



wherein Z and Z′ are both hydrogen or Z and Z′ together form a bond between the carbon atoms to which they are attached; and —NRR′ is selected from the group consisting of (lower alkyl)amino and di(lower alkyl)amino.

4,258,212

PROCESS FOR PREPARING POLYSULFIDE CHAIN TERMINATOR

William N. Schenk, Peninsula, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 17, 1979, Ser. No. 104,227

Int. Cl.³ C07C *149/00*

U.S. Cl. 568—22 **6 Claims**

1. A two-step process for the preparation of a mixture of hydroxyl-containing disulfide and trisulfide starting with a mercapto-lower alkanol, comprising, in a first step, (a) adding a stoichiometric amount of H_2O_2 to an aqueous mixture of said mercapto-lower alkanol in a reaction vessel, (b) maintaining said vessel's contents at a pH in the range from 7 to 9, (c) maintaining said contents at a temperature in the range from above their freezing point but below 20° C., and (d) forming an essentially pure dihydroxy-disulfide; and,

in a second step, (e) adding a predetermined amount of sulfur to the contents of said vessel sufficient to form a dihydroxy-trisulfide in a predetermined ratio from about 1 to about 25 percent by weight of disulfide-trisulfide mixture, (f) heating the contents at a rate less than 1°/minute to a maximum temperature of 100° C., and, (g) recovering a mixture of dihydroxy-disulfide and dihydroxy-trisulfide in said predetermined ratio.

4,258,213

DERIVATIVES OF 2-NITROBENZOFURAN

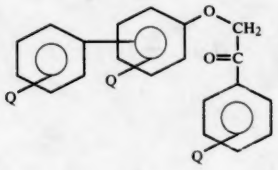
Walton J. Hammar, and Mark A. Rustad, both of St. Paul, Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 13,543, Feb. 21, 1979, which is a division of Ser. No. 862,014, Dec. 19, 1977, Pat. No. 4,153,721. This application Jan. 21, 1980, Ser. No. 113,533

Int. Cl.[3] C07C *49/807*

U.S. Cl. 568—331 4 Claims

1. A compound of the formula



wherein one of the Q groups is bromine and two of the Q groups are hydrogen.

4,258,214

PROCESS FOR THE PRODUCTION OF ALDEHYDES

Helmut Bahrmann, Hiinxe; Boy Cornils, Dinslaken; Gerhard Diekhaus, Oberhausen; Waldemar Kascha, Oberhausen, and Jürgen Weber, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Jul. 25, 1979, Ser. No. 60,561

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1978, 2833538

Int. Cl.[3] C07C *45/50*

U.S. Cl. 568—454 9 Claims

1. A process for preparing an aldehyde of the general formula R—$CH(CH_3)$—CHO where R is a straight-chain alkyl group having 7 to 12 carbon atoms which comprises contacting an olefin of the formula R—CH=CH_2 wherein R is a straight-chain alkyl group having 7 to 12 carbon atoms with carbon monoxide and hydrogen at 80° to 170° C. under a pressure of 200 to 350 bars in the presence of a complex phosphine containing rhodium compound and thereafter subjecting the reaction product to thermal treatment at 100° to 190° C.

4,258,215

HYDROFORMYLATION PROCESS

John L. Dawes, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1979, Ser. No. 70,587

Int. Cl.[3] C07C *45/50*

U.S. Cl. 568—454 16 Claims

1. In a process for the hydroformylation of olefins to produce aldehydes which comprises contacting an alpha-olefin having up to about 20 carbon atoms with carbon monoxide and hydrogen in the presence of a catalytic quantity of a complex catalyst consisting essentially of rhodium in combination with carbon monoxide and a triorganophosphorus ligand selected from the group consisting of trialkylphosphines, tricycloalkylphosphines, triarylphosphites and triarylphosphines wherein there is present at least two moles of said ligand per mole of rhodium at a temperature of from about 90° C. to about 160° C. the improvement wherein the reactor feed is a two-phase system consisting of an aqueous phase and an organic phase comprising said alpha-olefin, complex catalyst and ligand and the reaction takes place at a pressure of from about 500 psig to about 3000 psig in the presence of from about 0.1 to about 10% of water.

4,258,216

VAPOR PHASE OXIDATION PROCESS FOR GLYOXAL

James B. Trecek, Wayne, and George L. Wiesner, Bound Brook, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 600,560, Jul. 31, 1975, abandoned. This application Apr. 9, 1979, Ser. No. 27,706

Int. Cl.[3] C07C *45/38*

U.S. Cl. 568—473 10 Claims

1. In the process of preparing glyoxal from ethylene glycol wherein a gaseous mixture of ethylene glycol, oxygen, and inert diluent gas is reacted at a temperature of between 180° C. and 600° C. in the presence of a catalyst containing as essential ingredients phosphorous with copper, with silver, or with both copper and silver, to form glyoxal, the improvement comprising incorporating in said gaseous mixture about 0.5 to 32 ppm. of a vapor of a bromine compound selected from the group consisting of bromoalkanes, arylbromides, and phosphorous tribromide.

4,258,217

PROCESS FOR PRODUCING METHACROLEIN

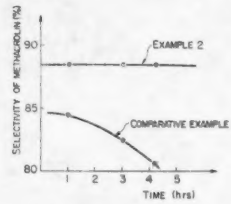
Atsushi Aoshima, Yokohama; Ryoichi Mitsui, and Tatsuo Yamaguchi, both of Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 11, 1979, Ser. No. 83,878

Claims priority, application Japan, Oct. 13, 1978, 53-125133; Nov. 6, 1978, 53-135881

Int. Cl.[3] C07C *45/30, 45/39*

U.S. Cl. 568—474 8 Claims



1. A process for producing methacrolein by oxidizing isobutylene or tert-butanol with molecular oxygen with a catalyst at a temperature up to 550° C. and a pressure up to 10 atmospheres, characterized in that the catalyst has the following composition:

$$Mo_{12}Bi_aFe_bNi_cPb_dX_fO_g$$

wherein X is at least one element selected from the group consisting of Rb, Cs, and Tl; and when X represents at least two of the elements f represents the sum of the elements; a is a value of 0.1 to 10; b is a value of 0.05 to 2; c is a value of 0.05 to 2; d is a value of 0.05 to 5; f is a value of 0.01 to 2; and g represents the number of oxygen atoms satisfying the valences of the elements.

4,258,218

CONVERSION OF ALCOHOLS OR ETHERS USING RARE EARTH ALUMINA

Francis G. Dwyer, West Chester, and Albert B. Schwartz, Philadelphia, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 861,767, Dec. 19, 1977, Pat. No. 4,156,698, which is a division of Ser. No. 794,163, May 5, 1977, abandoned. This application Jan. 25, 1979, Ser. No. 6,408

Int. Cl.[3] C07C *41/09*

U.S. Cl. 568—698 5 Claims

1. A process for converting a feed comprising a C_1–C_4 monohydric alcohol to its corresponding ether by contacting

said feed with a catalyst comprising a composited rare earth and alumina.

4,258,219

PROCESS FOR PRODUCING HYDROQUINONE

Nobukatsu Kato, Tokai; Tsutomu Takase, Nagoya, and Yoshio Morimoto, Tokai, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Oct. 19, 1979, Ser. No. 86,666

Claims priority, application Japan, Oct. 27, 1978, 53-131710; Oct. 27, 1978, 53-131711; Oct. 27, 1978, 53-131712; Oct. 31, 1978, 53-133166; Nov. 15, 1978, 53-139808

Int. Cl.³ C07C *37/01*

U.S. Cl. 568—771 **20 Claims**

1. A process for producing hydroquinone, which comprises feeding p-isopropenyl phenol, a slightly or hardly water-soluble high-boiling polar solvent which is an alcohol selected from the group consisting of heptyl alcohol, n-octyl alcohol, 2-ethylhexanol, i-octyl alcohol, n-nonyl alcohol and decanol, a strong acid having a pKa value of not more than about 1.0, and hydrogen peroxide or an organic peroxide at a temperature of at least 25° C. but below the reaction temperature, and performing the oxidation reaction of the p-isopropenyl phenol at a temperature in the range of 28° C. to 50° C.

4,258,220

PURIFICATION OF 2,6-XYLENOL STREAMS

Bruce E. Leach, and Charles M. Starks, both of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Jan. 28, 1980, Ser. No. 116,057

Int. Cl.³ C07C *37/68, 37/11*

U.S. Cl. 568—804 **8 Claims**

1. An improved method for separating 2,6-xylenol from admixture with meta-para-cresols by methylating meta-para-cresols with methanol over a catalyst to form 2,4-/2,5-xylenol and 2,3-xylenol, then separating 2,6-xylenol from the product mixture by distillation, wherein the methylation is carried out at temperatures of from about 400° C. to about 500° C., pressures of from about atmospheric to about 10 atmospheres and a methanol/phenolic mole ratio of from about 0.1 to about 5.0, the improvement comprising using a catalyst comprising

(a) about 85 to about 90% by weight magnesium oxide,

(b) 3 to 8% by weight amorphous titanium, chromium, uranium, or mixtures of these,

(c) 1.5 to 8% by weight sulfate ion, all based on the total weight of the catalyst.

4,258,221

CLEAVAGE OF ALKYLENEBISPHENOLS

Ronald D. Knudsen, and Geir Björnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

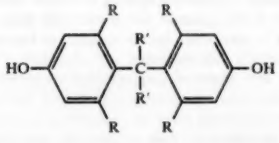
Filed Apr. 11, 1979, Ser. No. 28,943

Int. Cl.³ C07C *37/52*

U.S. Cl. 568—806 **8 Claims**

1. A process for splitting alkylenebisphenols which comprises contacting

(a) at least one alkylenebisphenol represented by the formula



wherein R′ can be hydrogen or an alkyl, cycloalkyl, or aryl group ranging from 1 to 11 carbon atoms and R can be a hydrogen or an alkyl group ranging from 1 to 6 carbon atoms with

(b) hydrogen in the presence of

(c) a catalytically effective amount of a catalyst consisting essentially of a mixture of nickel oxide, manganese oxide and a metal oxide support selected from the group consisting of magnesium oxide, aluminum oxide, silicates and mixtures thereof under reaction conditions of temperature, pressure and for a period of time sufficient to cause (a) to be cleaved and produce phenol and alkyl- and/or alkenyl-substituted phenols.

4,258,222

PROCESS FOR THE PRODUCTION OF LOW MOLECULAR WEIGHT POLYHYDROXYL COMPOUNDS

Edgar Möhring, Bergisch-Gladbach; Hanns P. Müller, and Kuno Wagner, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 6, 1979, Ser. No. 55,656

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831719

Int. Cl.³ C07C *31/18*

U.S. Cl. 568—863 **12 Claims**

1. A process for the production of low molecular weight polyhydric alcohols by hydrogenating formose solutions in the presence of metal catalysts comprising

(a) introducing an at least 20% solution of formose, of which the pH-value was adjusted before hydrogenation to a value of from 7.5 to 12.5, in batches into a first reactor in a manner such that the content of reducible groups, determined as carbonyl groups, in the reactor does not exceed a level of 2% by weight;

(b) hydrogenating the solution in batches in the presence of a first catalyst being selected from the group consisting of metals having atomic numbers of from 23 to 29 and mixtures thereof, said metals, being in elemental and/or oxidic form, the catalyst remaining constant in the reaction and the ratio of formose to said first catalyst in said first reactor being from 3 to 30 times by weight;

(c) withdrawing the reaction product in batches from the first reactor after the content of reducible groups, determined as carbonyl groups, has fallen to below 1.5% by weight;

(d) adjusting the pH-value of the reaction product to between 3 and 7;

(e) introducing said reaction product in batches into a second reactor;

(f) hydrogenating said reaction product in batches in the presence of a second catalyst said second catalyst remaining constant in the second reactor and being selected from the group consisting of metals having atomic numbers of 44, 45, 75 and 77, compounds thereof, and mixtures thereof, the ratio of the reaction product from step (c) to said second catalyst in said second reactor being from 50 to 5000 times by weight; and

(g) after a residence time of from 5 minutes to 4 hours withdrawing the reaction product of the second hydrogenation stage in batches from the second reactor.

4,258,223

PROCESS FOR THE PREPARATION OF TERTIARY BUTYL ALCOHOL

Ralph Levine, Freehold, and Jerome R. Olechowski, Lawrenceville, both of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed Aug. 8, 1978, Ser. No. 932,090

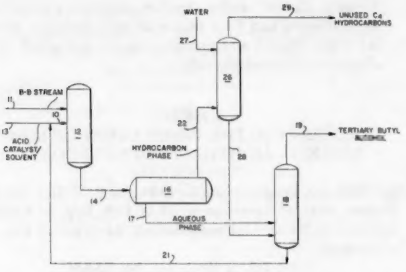
Int. Cl.³ C07C *29/04*

U.S. Cl. 568—899 **10 Claims**

1. A process which comprises:

(a) contacting a C_4 hydrocarbon stream containing at least

about 8% by weight of isobutylene and less than about 100 ppm sulfur in a reaction zone at a temperature of about 10°–80° C. with an aqueous acid solution comprising about 50–80% by weight of an aryl or alkaryl sulfonic acid in such proportions as to provide about 1–10 parts by weight of acid solution per part by weight of isobutylene,



(b) recovering from the resultant reaction mixture an aqueous phase comprising t-butyl alcohol, water, and hydrocarbyl sulfonic acid, and

(c) recovering t-butyl alcohol from the aqueous phase.

4,258,224

PROCESS FOR RECOVERING TNT ISOMERS

Charles Ribaudo, Somerville; John F. Leccacorvi, Oak Ridge, and Everett E. Gilbert, Morristown, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 26, 1979, Ser. No. 107,194
Int. Cl.³ C07G *79/10*
U.S. Cl. 568—935 **10 Claims**

1. A process for purifying a mixture of trinitrotoluene (TNT) isomers consisting essentially of α-TNT isomer, as a major constituent, and unsymmetrical 2,4,5- and 2,3,4-isomers comprising the steps of uniformly introducing the isomer mixture into an absorbent packed column and separating said mixture into its isomers in said column through use of a developing solvent system in which the isomers are soluble and separating the component isomer from the absorbent within the column.

4,258,225

TaF_5 AND NbF_5 AS FLUORINATION CATALYSTS

Andrew E. Feiring, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 15, 1977, Ser. No. 824,729
Int. Cl.³ C07C *17/08*
U.S. Cl. 570—168 **11 Claims**

1. The process of contacting under substantially anhydrous conditions at a temperature range of 0° to 200° C. one mole of a halogenated olefin of the formula

$$R_1R_2C{=}CR_3R_4$$

wherein

R_1 is H, F, Cl, CH_3, CCl_3 or CF_3;
R_2 is H, F or Cl;
R_3 is H, F, or Cl;
R_4 is F or Cl;

in which at least two of the R groups are F or Cl; with 1 to 8 molar equivalents of HF and in the presence of 0.01 to 0.25 molar equivalents of TaF_5 or NbF_5 to produce a fluorinated alkane having one hydrogen atom over and above the number of hydrogen atoms originally present in the halogenated olefin.

4,258,226

AROMATIC HYDROGENATION

Giovanni Dozzi, Milan, and Salvatore Cucinella, San Donato Milanese, both of Italy, assignors to Anic, S.p.A., Palermo, Italy

Division of Ser. No. 921,002, Jun. 30, 1978, Pat. No. 4,217,246. This application Dec. 14, 1979, Ser. No. 103,489
Claims priority, application Italy, Jul. 27, 1977, 26190 A/77
Int. Cl.³ C07C *5/02, 5/10*
U.S. Cl. 585—270 **19 Claims**

1. A method for hydrogenating aromatic unsaturated compounds characterized in that an aromatic unsaturated compound is caused to react with a catalyst system composed by:

(a) A metal selected from the group consisting of the metals of the Groups IIA and IIIA of the Periodic System,

(b) a primary or a secondary amine,

(c) a halide selected from the group consisting of the halides of cobalt and nickel, and

(d) an activator.

4,258,227

SHORT RESIDENCE HYDROPYROLYSIS OF RESIDUES FROM AROMATIC CARBOXYLIC ACID MANUFACTURE

John K. Allen; Agnes M. Palka, both of St. Charles, Ill., and Edward A. Lambers, Somerset, N.J., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 6, 1979, Ser. No. 100,837
Int. Cl.³ C07C *1/20*
U.S. Cl. 585—469 **3 Claims**

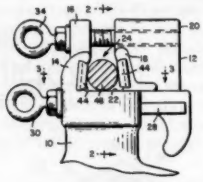
1. A method of decarboxylating and decarbonylating the mixture of oxygen-containing aromatic compounds and organic acid salts of cobalt and/or manganese obtained as a residue in the manufacture of a benzene di- or tricarboxylic acid by the liquid phase oxidation of a di- or trialkylbenzene in the presence of catalysis provided by the combination of bromine and one or both of cobalt and manganese or the insoluble mixture of catalyst metal-free oxygen-containing aromatic compounds obtained by extracting with water the catalyst metals from said residue, which method comprises heating said residue or the water-insoluble portion thereof to a temperature of from 700° C. up to 900° C. at a rate of above 600° C. per second in the presence of hydrogen gas under a hydrogen pressure of from 80 up to 150 kg/cm² for a vapor-gas residence time of less than one second down to 0.1 second whereby there is formed a hydrocarbon product including vapors of benzene and toluene together with the lower alkanes mixed with hydrogen and oxides of carbon; and collecting at least the vapors of benzene and toluene.

4,258,228

ELECTRICAL INSULATOR HAVING CLAMPING JAWS WITH SEPARATELY FABRICATED LINER MEMBERS

Leonard P. Jean, Nashua, and Ernest J. La Chance, Sr., Milford, both of N.H., assignors to Hendrix Wire & Cable Corp., Milford, N.H.

Filed Aug. 9, 1979, Ser. No. 65,216
Int. Cl.[3] H01B 17/22
U.S. Cl. 174—168 10 Claims



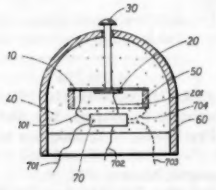
1. In an electrical insulator having opposed jaws, at least one jaw being adjustable in relation to the other jaw for clamping an electrical conductor therebetween, the said jaws consisting of plastic pieces which are molded at elevated temperatures and which undergo thermal contraction when cooled subsequent to the molding process, the improvement comprising: opposed grooves in the confronting surfaces of said jaws; and, liner members consisting of a material different from that of said jaws, said liner members being inserted into said grooves while the interior groove dimensions are expanded as a result of the elevated molding temperatures, with the subsequent thermal contraction of the internal groove dimensions during cooling resulting in said liner members being firmly anchored within said grooves.

4,258,229

BODY VIBRATION PICKUP

Albert Eggert, and Wolfgang Schmidt, both of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 19, 1979, Ser. No. 86,580
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1978, 7831611[U]
Int. Cl.[3] H04R 1/46
U.S. Cl. 179—1 ST 15 Claims



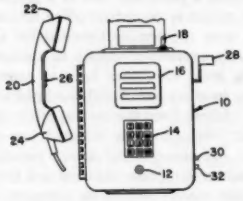
1. In a body vibration pickup including a housing, a piezoelectric element disposed in the housing and a vibration conductor mounted to conduct sound vibrations of a body to the piezoelectric element, the improvement comprising a diaphragm disposed in said housing between said piezoelectric element and said vibration conductor in an electrically conductive manner, and a resilient cast mass disposed in said housing and in which said diaphragm, said piezoelectric element and the part of said vibration conductor which extends into said housing are embedded.

4,258,230

PARTY LINE TELEPHONE SYSTEM

Herbert Heller, Pittsburgh, and Paul W. Schmitt, Cheswick, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jun. 15, 1979, Ser. No. 48,911
Int. Cl.[3] H04M 9/02
U.S. Cl. 179—17 A 8 Claims



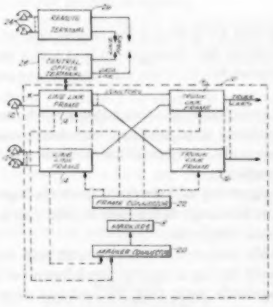
1. In a telephone communication system, a plurality of telephone stations interconnected by a single pair of electrical conductors, transmitting and receiving means at each of said stations, individual normally-off microprocessor means associated with each of said stations, means at each of said stations for impressing on said conductors a wake-up pulse followed by a pulse train identifying another station to be called, means at each station responsive to the wake-up pulse for connecting a source of electrical power to the microprocessor means at that station, means in the microprocessor means at each station for comparing said pulse train with a code identifying its associated station, and means for returning the microprocessor to an off condition if the pulse train does not match the said identifying code.

4,258,231

REMOTE LINE SWITCHING EXTENSION FOR TELEPHONE EXCHANGE

Vernon C. Lenz, Westminster; William H. Draeger, Corona, and Ronald J. Surprenant, Anaheim, all of Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Aug. 3, 1979, Ser. No. 63,456
Int. Cl.[3] H04Q 3/60, 11/04
U.S. Cl. 179—18 FC 10 Claims



1. Remote switching apparatus for use with central office equipment of a type connecting any selected one of a plurality of local subscriber lines to a selected one of a lesser number of line-links through crossbar switch means in response to a reference voltage applied to the subscriber line, comprising: a remote terminal including matrix switching means for connecting any one of a plurality of remote subscriber lines at the remote terminal to a lesser number of line pairs extending from the remote terminal to the central office; a central office termi-

nal including means responsive to an address for applying a reference voltage to one of the terminals of said local subscriber lines selected by the address for initiating a connection through one of said line-links at the central office equipment, switch means at the central office terminal for connecting one of said line pairs directly to the selected line-link in the central office equipment; means transferring a remote subscriber phone address from the remote terminal to the central office terminal identifying a particular one of a plurality of remote subscriber lines; means at the central office terminal responsive to the address from the remote terminal for activating said means for applying a reference voltage to a selected one of the terminals of the local subscriber lines to cause said central office equipment to select one of said line-links; means transferring a line-link address from the central office terminal to the remote terminal identifying the selected line-link and connected line pair; and means at the remote terminal responsive to the remote subscriber phone address and line-link address for operating said matrix switch to complete a connection between the connected line pair and the remote subscriber phone.

4,258,232

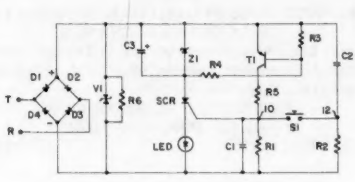
LINE HOLD CIRCUITS

Maurice I. Smith, Carnation, and John D. Gillen, Kirkland, both of Wash., assignors to Tone Commander Systems, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 958,120, Nov. 6, 1978, abandoned. This application May 25, 1979, Ser. No. 42,572

Int. Cl.³ H04M *3/22, 1/00*

U.S. Cl. 179—99 R **18 Claims**



1. A single line hold circuit for connection to a telephone line, said telephone line having a tip lead and a ring lead with a telephone connected between said tip lead and said ring lead, comprising:

a thyristor switchable between a low impedance state and a high impedance state, said low impedance state having an impedance sufficiently small to maintain the telephone in a hold condition;

means for triggering said thyristor from the high impedance state to the low impedance state to establish a hold condition for said telephone;

a Zener diode connected in series with said thyristor, said Zener diode having a reverse breakdown voltage of sufficient magnitude such that the voltage drop across the series connection of said thyristor in the low impedance state and said Zener diode is greater than the voltage drop between the tip and ring leads with the telephone in the off-hook position for switching said thyristor to the high impedance state when the telephone goes off-hook, thereby causing the telephone line to leave the hold mode; and

hold maintenance means for causing said thyristor to be in the low impedance state when loop current in the tip and the ring leads resumes within a predetermined time after interruption of the loop current.

4,258,233

TRACK SKIPPER APPARATUS FOR VIDEO DISC PLAYER

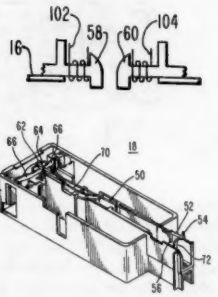
Elvin D. Simshauser, Columbus, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 15, 1979, Ser. No. 39,358

Claims priority, application United Kingdom, Nov. 16, 1978, 44734/78

Int. Cl.³ G11B *21/00*

U.S. Cl. 369—33 **4 Claims**



1. In a system for recovering prerecorded information from a disc record having a spiral information track by a track-following stylus when stylus/record relative velocity is established; wherein normal operation of said system involves sensing of said prerecorded information along successive convolutions of said spiral track in a regular progression toward one extremity; an apparatus comprising:

(A) a carriage subject to translatory motion in correlation with radial motion of said track-following stylus during playback; said carriage having an opening in a bottom wall thereof;

(B) a stylus arm carrying said track-following stylus at one end thereof;

(C) means for yieldably securing the other end of said stylus arm to said carriage; said yieldable securing means permitting said track-following stylus to protrude through said opening when said stylus arm is lowered during playback;

(D) a permanent magnet secured to said stylus arm near said one end thereof;

(E) a pair of spaced coils having non-magnetic cores for providing a substantially uniform magnetic field therebetween upon energization;

(F) means for mounting said pair of coils to said carriage such that said permanent magnet is disposed therebetween; and

(G) means for selectively energizing said coils to cause a shift in the radial location of said track-following stylus.

4,258,234

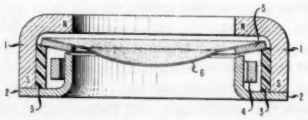
ELECTROACOUSTIC DEVICE

Chester M. Bordelon, Shreveport, La., and Richard C. Sherwood, New Providence, N.J., assignors to Western Electric, Incorporated, New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 24, 1979, Ser. No. 69,276

Int. Cl.³ H04R *13/02*

U.S. Cl. 179—114 R **6 Claims**



1. Device comprising a magnetic circuit comprising (1) a first magnetic component which is magnetized in a preferred

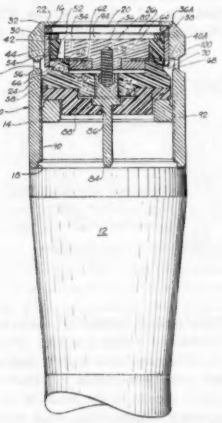
direction, (2) a second magnetic component whose magnetic coercivity is less than the magnetic coercivity of said first component and which is magnetically biased by said first component, (3) first means for inducing a variable magnetic field in said circuit, and (4) second means for utilizing energy output, characterized in that (a) said first component consists essentially of a first alloy which comprises a first amount which comprises at least 90 weight percent of said alloy and which consists of Fe, Cr, and Co, Cr being present in said first alloy in an amount in the range of 20–40 weight percent of said first amount and Co being present in said first alloy in an amount in the range of 3–30 weight percent of said first amount, and (b) said second component consists essentially of a second alloy which comprises a second amount which comprises at least 95 weight percent of said alloy and which consists of Fe and Al, Al being present in said second alloy in an amount in the range of 1.5–18 weight percent of said second amount.

4,258,235

PRESSURE GRADIENT ELECTRET MICROPHONE

Alan R. Watson, Niles, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Filed Nov. 3, 1978, Ser. No. 957,060
Int. Cl.³ H04R *1/20, 19/04*
U.S. Cl. 179—121 D **9 Claims**



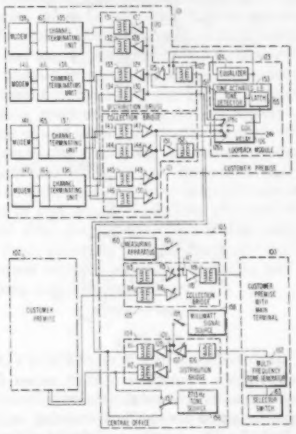
1. A directional condenser microphone comprising a hollow casing having an opening extending from the exterior to the interior thereof, an electrically conducting diaphragm disposed in a flat plane confronting the opening in the casing, means for mounting said diaphragm on the casing and acoustically sealing the diaphragm about the perimeter of the opening, an electrically conducting back plate mounted in the casing and electrically insulated from the diaphragm, said back plate having a flat surface disposed parallel to and confronting the side of the diaphragm opposite the opening, means including the back plate and diaphragm forming a cavity between the diaphragm and back plate, and channel defining means including the cavity forming means and casing defining a plurality of channels, each of said channels having a first port at one end and a second port at the other end, the first port of each channel communicating with the cavity and being located adjacent to the perimeter of the back plate, and the first ports of the plurality of channels being spaced from each other, the portion of each of said channels adjacent to the first port being acoustically isolated from each other, the second port of each channel being located on the exterior of the casing, said second ports being spaced from the plane of the diaphragm by approximately the same distance, said cavity being acoustically coupled to the sound field exterior of the casing only through the diaphragm and the channels.

4,258,236

REMOTE TELEPHONE LINE SWITCHING AND TESTING

Charles E. Conklin, Pleasant Valley, and Duncan Bruce, Rensselaer, both of N.Y., assignors to Conklin Instrument Corporation, Pleasant Valley, N.Y.

Filed Apr. 4, 1979, Ser. No. 27,138
Int. Cl.³ H04B *3/46;* **H04M** *3/26*
U.S. Cl. 179—175.3 R **16 Claims**



1. A remote telephone line switching and testing circuit for a four-wire communication system of the type wherein two wires are used for transmission and two wires are used for reception, said system providing communication between equipment at a first location and equipment at at least a second remote location and including a central office connected to said first location and said at least second remote location by respective four-wire lines and providing a communication path therebetween, said remote telephone line switching and testing circuit comprising:

tone detecting means adapted to be connected to the two wires used for reception at said second remote location and responsive to tones of a predetermined frequency for providing output detection signals;

control means responsive to the output detection signals from said tone detecting means for generating first and second control signals in response to successive output detection signals; and

switching means responsive to said first control signal for disconnecting the equipment at said second location from the four-wire line and providing a quiet termination for each of the two wires used for reception and the two wires used for transmission which are disconnected from said equipment, said switching means further being responsive to said second control signal for reconnecting the equipment at said second location to the four-wire line.

4,258,237

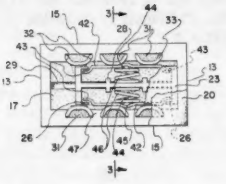
SWITCH ASSEMBLY

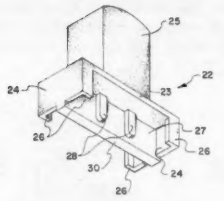
Wesley H. Beck, 307 Church St., Clayton, N.C. 27520

Filed Oct. 4, 1978, Ser. No. 948,565
Int. Cl.³ H01H *15/00, 19/54, 21/76*
U.S. Cl. 200—11 J **12 Claims**

1. An electrical type switching means comprising: a switch housing having side wall means and a bottom means; a plurality of slot-like openings provided in the interior portion of said side wall means, the interior edge of each said slots being more constricted in cross section than the remainder of said slot; openings in said bottom means a parallel alignment with each of said slot means; electrically conductive terminal means

slidingly mounted into and retained by said slot means and projecting outwardly through said openings in said bottom, the slot engaging portion of each of said terminal means being generally arcuate in cross section and convexingly disposed relative to the interior side wall means of said housing; actuator





motivated, electrically conductive contact means for making and breaking contact between said terminals; and a cover means for enclosing said housing and retaining said terminals within said slots whereby an improved electrical switch means is provided.

4,258,238

LIQUID LEVEL SIGNAL TRANSMITTER

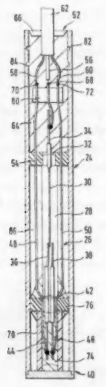
Ferdinand Dombrowski, Kaarst-Vorst, and Dieter Förster, Haan, both of Fed. Rep. of Germany, assignors to Sunvic Regler GmbH, Solingen, Fed. Rep. of Germany

Filed Aug. 9, 1979, Ser. No. 65,177

Claims priority, application United Kingdom, Sep. 6, 1978, 2838723

Int. Cl.³ H01H *35/18*

U.S. Cl. 200—84 C **12 Claims**



1. In a magnetic drive liquid level signal transmitter comprising a body having a side with a magnetic flux permeable wall therein, a float assembly outside said body, a magnet connected to the float to be moved thereby and positioned adjacent the exterior of said wall, a body mounted sleeve at the other side of the wall, said sleeve having an open end, a closed end and an inner wall defining a cavity, a reed switch assembly comprising a reed switch in an inert gas-filled housing, said switch assembly being within said cavity and having a first end adjacent said closed end and a second end closer to said open end than is said first end, said assembly including wires connected to said switch, a cable extending into the open end of the sleeve and having electric lines therein which are soldered to said wires respectively at joints, and a poured sealing mass embedding said switch assembly at said open end, the improvement comprising:

an elastomeric plate extending between and engaging said swtich assembly at said second end thereof and the inner wall of the sleeve, said plate forming a transverse seal across said cavity between said housing and the inner wall,

said soldered joints being within the part of the cavity between said plate and said open end,

said poured sealing mass filling said part of said cavity and tightly encasing said joints, said mass having a low coefficient of thermal expansion.

4,258,239

ELECTRIC CIRCUIT BREAKER

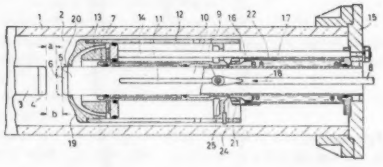
Dieter Noack, Berlin, and Winfried Oltersdorf, Maintal, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 17, 1978, Ser. No. 870,067

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1977, 2703550

Int. Cl.³ H01H *33/88*

U.S. Cl. 200—148 A **7 Claims**



1. In an electrical circuit breaker of the type in which electrical arcs are quenched by blasting with a gas during opening of the breaker and which includes a first stationary contact element; a second axially-movable contact element slidably mounted in support means in the breaker and disposed coaxially and in opposing relationship with respect to said first contact element, said second contact element being movable during opening of the breaker between a first arc-quenching position and a second separation position, said arc-quenching position being axially closer to said first stationary contact element than said second separation position; a third tubular contact element disposed coaxially around and in engagement with said second contact element and movable axially into engagement with said first contact element for bridging and electrically connecting said first and second contact elements during closing of the breaker; and means for moving said third movable contact element into engagement with said first contact element during closing of the breaker and for providing a flow of a gaseous quenching medium under pressure between said first and second contact elements during opening of the breaker for quenching arcs drawn between said first and second contact elements during separation of said elements; the improvement comprising:

first means disposed coaxially around and coupled to said second movable contact element;

second means disposed coaxially around said second movable contact element axially adjacent to said first means and in a position axially closer to said first stationary contact element than said first means, said second means being mounted in said breaker in a fixed position with respect to said second contact element and said first

means, and said first means and said second contact element being movable with respect to said second means; and

spring means, disposed in engagement with said support means and said first means, for biasing said first means into engagement with said second means, and thereby said second movable contact element into said arc-quenching position during closing of said breaker, said first means being further disposed in relationship to said third tubular contact element so as to be engaged by said contact during opening of said breaker and bias said first means out of engagement with said second means, and thereby said second movable contact element into said separation position.

4,258,240

METHOD AND APPARATUS FOR RADIO FREQUENCY DRYING OF LUMBER

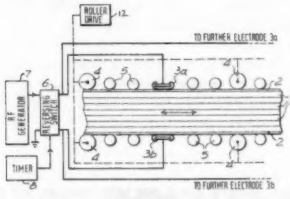
John H. Pless, London, England, assignor to Electron Kilns (Luzern) GmbH, of Zahringerhof, Lucerne, Switzerland

Filed Feb. 6, 1979, Ser. No. 9,786

Claims priority, application United Kingdom, Feb. 7, 1978, 4912/78

Int. Cl.[3] **H05B** *6/54, 6/60;* **F26B** *3/34*

U.S. Cl. 219—10.41 **9 Claims**



1. A method of drying boards by radio frequency heating comprising:

positioning a stack of boards to be dried between opposed electrodes adjacent opposite sides of the stack;

connecting one of said electrodes to a source of radio frequency current while grounding the other electrode;

periodically reversing the connections of said electrodes to the source and to ground; and

causing reciprocating relative movement between said stack and said electrodes in a direction longitudinally of said stack.

4,258,241

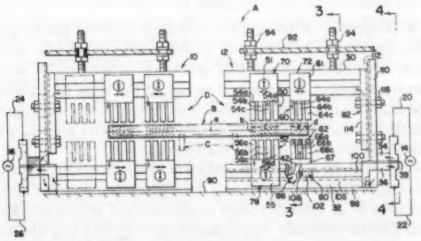
SLOT FURNACE FOR INDUCTIVELY HEATING AXIALLY SPACED AREAS OF A WORKPIECE

David R. Soworowski, Boaz, Ala., assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Mar. 28, 1979, Ser. No. 24,702

Int. Cl.[3] **H05B** *6/40*

U.S. Cl. 219—10.71 **8 Claims**



1. An induction heating inductor for heating first and second axially spaced portions of an elongated workpiece having a central axis and carried by a conveyor along a transversely extending feedline generally perpendicular to said central axis, said inductor comprising: first and second axially spaced pairs of generally straight, parallel conductor elements, said elements in each pair extending generally parallel to said feedline with the first of said conductor elements of each pair being on one side of said feedline and the second of said conductor elements of said pair being on the opposite side of said feedline; means for connecting said elements of each of said pairs in electrical series; means for adjusting the axial spacing between said pairs of conductor elements; said conductor elements each having first and second spaced ends and including a first interconnecting conductor means for electrically connecting said first ends of said first conductor elements of said pairs; second interconnecting conductor means for electrically connecting said first ends of said second conductor elements of said pairs; third interconnecting means for electrically connecting said second ends of said first conductor elements of said pairs; and, fourth interconnecting means for electrically connecting said second ends of said second conductor elements of said pairs wherein said first, second, third and fourth interconnecting means are rigid, generally straight conductors and said first adjusting means includes means for adjusting said conductor elements along said rigid conductors.

4,258,242

WELDING PROCESS FOR PRODUCTION OF A STEEL PIPE

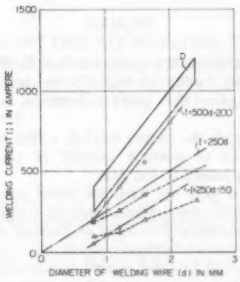
Shigeo Fujimori, 645-128, Takamori, Isehara-shi, Kanagawa-ken; Tohru Saito, 3-4, Kyowa 3-chome, Sagamihara-shi, Kanagawa-ken; Kozaburo Otani, 9-6, Yokodai 2-chome, Sagamihara-shi, Kanagawa-ken, and Taizi Nagatani, 2-21, Kyowa 3-chome, Sagamihara-shi, Kanagawa-ken, all of Japan

Filed Sep. 11, 1978, Ser. No. 940,892

Claims priority, application Japan, Jun. 30, 1978, 53-79648

Int. Cl.[3] **B23K** *31/06*

U.S. Cl. 219—61 **9 Claims**



1. A welding process for the production of a steel pipe comprising the step of:

abutting the chamfered ends of a steel plate bent into the shape of a pipe to define a grooved joint with the groove opening upwardly;

welding said joint by the steps of:

forming at least a first welding layer in said joint by carrying out a gas metal arc welding process on said joint with said joint underlying the welding apparatus and carrying out said process under an atmosphere of shielding gas which is a mixture containing mainly an inert gas and carbon dioxide and (1) utilizing a high electrical current I in amperes in the range defined by the formula:

$$500d \geqq I \geqq 500d - 150$$

wherein d is the diameter of the welding wire in mm, and with

a diameter of the welding wire in the range of from 0.8 to 2.4 mm, whereby the generation of a rotating arc is suppressed due to the current flowing through the wire within said gas mixture and an arc is generated which is sufficiently stiffened by the pinch force due to the high current density to ensure the resistance of the arc to deflection of the arc by magnetic blow, and the penetration of the base metal is enhanced, and (2) making the length l in mm of the welding wire between the end of a current contact tip of the welding apparatus and the bottom of the grooved joint according to the formula:

$$l > 10d + 5$$

whereby the deposition rate of molten metal is increased; and thereafter forming the last welding layer in said joint by carrying out a submerged arc welding on said joint.

4,258,243

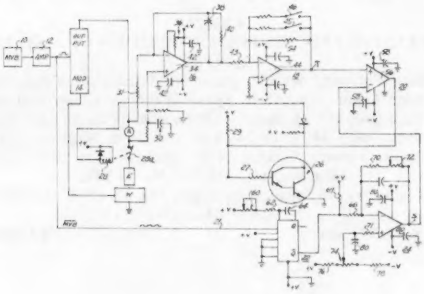
OVER CURRENT PROTECTION SYSTEM FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

Oliver A. Bell, Jr., Statesville; Randall C. Gilleland, Troutman, and Davey J. Chance, Concord, all of N.C., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Mar. 26, 1979, Ser. No. 23,633

Int. Cl.³ B23P *1/02*

U.S. Cl. 219—69 S **14 Claims**



1. The method of protecting an electrical discharge machining power supply circuit having a pulse generator and an output module against over current operation, comprising the steps of:

(a) deriving from the output module a first voltage signal representative of average current of working power pulses being passed to the gap;

(b) sensing and deriving from the pulse generator output frequency a second voltage signal as a reference representing a maximum safe level of current at each given frequency of working power pulses;

(c) comparing said first and second voltage signals; and

(d) interrupting the operation of the power supply responsive to said first signal being greater than said second signal.

4,258,244

METHOD FOR REDUCING OPERATING NOISE OF THE AIR-CARBON ARC CUTTING AND GOUGING PROCESS

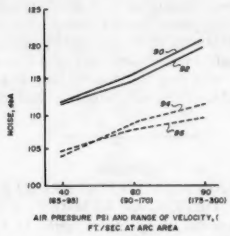
Perry Rieppel, Worthington, and Raymond Sadauskas, Columbus, both of Ohio, assignors to Arcair Company, Lancaster, Ohio

Division of Ser. No. 848,827, Nov. 7, 1977, Pat. No. 4,166,209. This application May 10, 1979, Ser. No. 37,791

Int. Cl.³ B23K *9/00*

U.S. Cl. 219—69 M **5 Claims**

1. A method of reducing the inherent operating noise level at least 8 dbA when utilizing the air-carbon arc cutting or gouging process to sever or prepare metallic objects for subsequent fabrication operations without imparing the ability of the process to perform in a conventional manner by improving the arc column stability by controlling the velocity of the air in the area where the air contacts the arc and arc column and melting the metallic object occurs so that said air velocity is between 90 and 170 feet per second;



said air velocity control being obtained by limiting air pressure delivered to the torch to a maximum of 60 psi; and maintaining an aerial path of the air stream from the point of origin in said torch to said arc and arc column a minimum distance of four inches.

4,258,245

RESISTANCE WELDING MACHINE

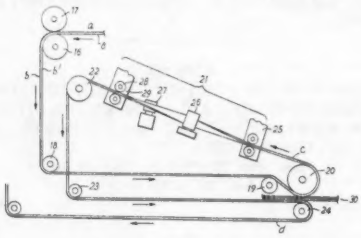
John Flaherty, Sutton in Ashfield, England, assignor to Metal Box Limited, Reading, England

Filed May 21, 1979, Ser. No. 40,868

Claims priority, application United Kingdom, May 30, 1978, 24463/78

Int. Cl.³ B23K *11/06*

U.S. Cl. 219—81 **14 Claims**

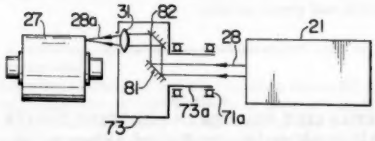


1. A method of operating a resistance welding machine of a kind having a wire electrode adapted to be urged into contact with a workpiece by a first electrode wheel and a second electrode wheel, said method including the steps of, feeding to the machine a wire having first and second surfaces extending parallel to the axis of the wire; moving the wire around a first electrode wheel to present the first surface of the wire to the workpiece and the second surface to the first electrode wheel, twisting the wire about its axis through an angle whilst moving the wire in an axial direction to present said second surface to said second electrode wheel; and presenting said first surface to the workpiece while the second surface of the wire is supported by the second electrode wheel.

4,258,246
ROTOR BALANCING DEVICE UTILIZING A LASER BEAM

Norio Karube; Yasuyuki Morita, both of Machida; Eizo Yamaka, Yokohama, and Takasi Kuno, Kunitachi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadom, Japan

Continuation of Ser. No. 762,350, Jan. 25, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,711
Claims priority, application Japan, Oct. 19, 1976, 51/125759
Int. Cl.[3] B23K *27/00*
U.S. Cl. 219—121 LW 4 Claims

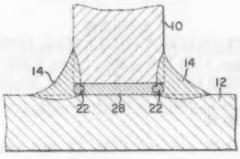


1. A system for dynamically balancing a rotor, comprising:
means for rotating the rotor;
means for detecting the dynamic unbalance of the rotor rotated by said rotating means, said detecting means determining the magnitude of the dynamic unbalance and an unbalance correcting position of the rotor;
an energy source generating a continuous laser beam capable of removing material from the rotor;
means for supplying an oxidizer at least to said correcting position of the rotor;
means for rotating the laser beam around the rotating axis of the rotor, said beam rotating means comprising a rotating cylinder synchronized in rotation with said rotor and a plurality of reflecting mirrors incorporated in said cylinder which constitute a reflective optical system for guiding the laser beam generated by said energy source, the laser beam from said energy source being introduced along the axis of said cylinder through the rear end of said cylinder and reflected through said mirrors so that the laser beam is converted into a laser beam rotating around the axis of said cylinder;
means for controlling the rotational speed and the rotating phase of the rotating laser beam so as to synchronize the rotating laser beam with the rotation of the rotor, thereby causing the laser beam projected onto the rotor surface to follow the unbalance correcting position on one end surface of the rotor; and
means for oscillating at least one of said reflecting mirrors to cause a continuous radial scanning of the laser beam spot over a substantially fixed area of said rotating rotor which includes the unbalance correcting position as said laser beam follows the unbalance correction position of said rotor, to remove from said one end surface of the rotor material extending over said area, and means for circumferentially vibrating said cylinder relative to the rotating rotor to cause the laser beam spot to scan said one end surface of the rotor circumferentially as well as radially.

4,258,247
METHOD OF PRODUCING WELDED JOINT INCLUDING NON-WELDED PORTION

Wataru Shimada, and Susumu Hoshinouchi, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 759,124, Jan. 13, 1977, abandoned. This application Nov. 28, 1978, Ser. No. 964,447
Claims priority, application Japan, Aug. 27, 1976, 51-102784; Aug. 27, 1976, 51-102787
Int. Cl.[3] B23K *9/02*
U.S. Cl. 219—137 R 7 Claims

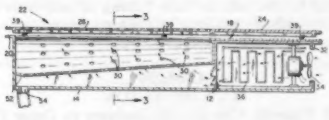


1. A method of producing a welded joint including a non-welded portion which comprises inserting a holding element in an area between a pair of metallic members to be welded to each other, said holding element containing a filler held at each end thereof such that the fillers are located at two root portions of the metallic members which face each other, said fillers extending outward from the holding element at both ends thereof so as to form filler-containing recesses in the metal to be deposited on the fillers in a subsequent welding step, effecting a welding by depositing a metal upon the fillers at the root portions of said metallic members so as to weld the metallic members together, said welded joint thus constituting an area containing a welded and a non-welded portion, said fillers forming recesses in the metal deposited on the root portions of the metallic members.

4,258,248
INSTANT HOT AIR WELCOME MAT

Louis Campo, 99-12 K Waverly Ave., Patchogue, N.Y. 11722

Filed Jan. 22, 1979, Ser. No. 5,371
Int. Cl.[3] F24H *3/04*
U.S. Cl. 219—369 4 Claims



1. An instant hot air welcome mat comprising a housing adapted for mounting in a floor framing, said housing open at the top and provided with an outwardly extending flange thereat, a louvered vertical partition dividing said housing into an enclosed heating chamber and a drain chamber, a downwardly displaceable top cover for said housing having a solid portion for enclosing said heating chamber and a grilled portion for said drain chamber, the top cover having an outwardly extending flange and superposed with the housing flange, a heating element mounted in said heating chamber, a blower mounted in a wall of the heating chamber and in communication with the atmosphere, spring-loaded screws interposed between the housing and cover flanges to allow a downward depression of the cover against the bias of said spring-loaded screws, a delayed time trip switch secured to said housing for

actuating said heating element and said blower for a predetermined time interval, and means secured to said cover flange and passing through the housing flange for operating said trip switch, said trip switch operating means aligned with but spaced apart from the switch means when the springs are relaxed, whereby a downward force applied by a person stepping on the cover causes the switch operating means to trip said switch thereby actuating the heating element and blower providing heated air to the drain chamber through the louvered partition for said predetermined time interval, the heated air passing through the grill to melt accumulated snow and ice on the cover and footwear alike, water therefrom draining into said drain chamber.

4,258,249

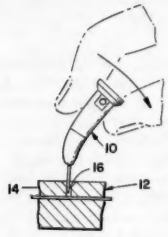
STYLUS FOR TABULATING DEVICE

John E. Ahmann, 1400 Duhig Rd., Napa, Calif. 94558

Filed Oct. 1, 1979, Ser. No. 80,260

Int. Cl.³ G07C *13/00*

U.S. Cl. 235—50 R **4 Claims**



1. A punch-out stylus for use with a tabulating device having an upper plate with holes adapted to register with scored punch-out areas on a tabulation sheet placed under the plate, said stylus comprising:

a main body section adapted to be gripped by the stylus user;

a tapered body section extending axially from said main body section and made of a flexible, elastomeric material;

a rigid pin member axially aligned with and having one end embedded within said tapered body section, with a portion of said pin member extending beyond the small end of said tapered body section; and a blunt, hardened and serrated tip portion at the outer end of said pin member;

whereby said pin member can be inserted into any hole in the upper plate of said tabulating device and said body can be bent to one side to cause flexing of said tapered body portion without breaking said pin member.

4,258,250

JAM DETECTOR

Stephen R. Schmidt, Chicago, Ill., assignor to Copar Corporation, Oak Lawn, Ill.

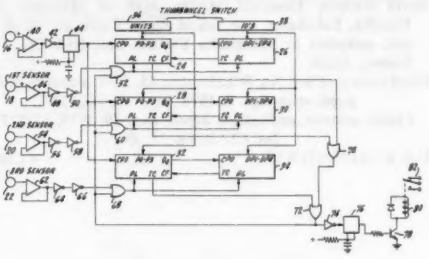
Filed Aug. 30, 1978, Ser. No. 937,938

Int. Cl.³ G06M *3/02*

U.S. Cl. 235—92 PE **4 Claims**

1. A system for use in detecting jams in a series of members of defined length moving along a predetermined path including pulse generating means for providing sequential pulses each representative of a unit of length, a plurality of counting means each having a preset number therein representative of the defined length of a member plus an additional fixed length substantially less than that of a member,

an equal number of sensing means adjacent said path and each providing a given output during the period it senses a member moving on said path, each sensing means being connected to a counting means, said pulse generating means being connected to each of said counting means with pulses from said pulse generating means changing the count in a counting means during the period that a member is sensed by the connected sensing means, a jam condition being indicated when the number of counted pulses



during the period a member is sensed at a sensing means equals said preset number.

4,258,251

APPARATUS FOR USE IN ORDERING TRIALS

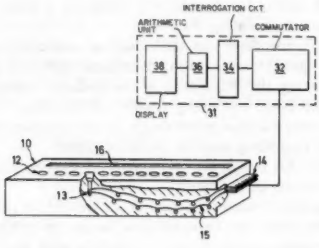
Gordon B. Donaldson, Glasgow, Scotland, assignor to University of Strathclyde, Glasgow, Scotland

Continuation-in-part of Ser. No. 17,563, Mar. 5, 1979, abandoned, which is a continuation of Ser. No. 811,838, Jun. 28, 1977, abandoned. This application Apr. 10, 1979, Ser. No. 28,912

Claims priority, application United Kingdom, Jun. 29, 1976, 27006/76

Int. Cl.³ G06M *3/08*

U.S. Cl. 235—92 AC **7 Claims**



1. Apparatus for use in conducting Ordering Trials, comprising

a set of counters respectively having unique characteristics the sequential ordering of which is to be undertaken by a subject,

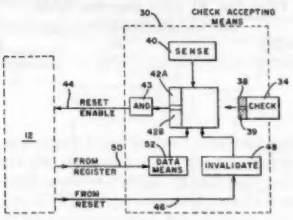
a holder having a set of identical locations respectively for receiving a said counter,

each counter comprising at least one electrical circuit element the electrical characteristic of which uniquely identifies that counter, the holder comprising a plurality of electrical conductors associated respectively with said locations, interengageable electrical terminals provided at said locations and on the counters such that when a particular location receives a particular counter the electrical circuit element of that counter is connected electrically to the pertaining electrical conductors, read-out means connected to said electrical conductors, said read-out means incorporating interrogation circuitry which is operable to determine the electrical characteristics of the counters in the respective locations, and an arithmetic unit operating according to a predetermined algorithm and connected to the output of the interrogation circuitry to provide a measure of the result of a trial.

4,258,252
CHECK CONTROLLED METERING DEVICE

Luther G. Simjian, Lago Mar Pl., 1750 S. Ocean La., Fort Lauderdale, Fla. 33316

Filed Jul. 19, 1979, Ser. No. 58,755
Int. Cl.[3] G06K 3/12; G06F 7/08
U.S. Cl. 235—432 11 Claims



1. A metering device of the postage meter type or similar type comprising:

a metering mechanism including printing means for printing adjustable indicia representative of monetary units;

register means including a credit register and a cumulative register coupled to said printing means for registering in response to the operation of said printing means respectively the credit balance remaining in the metering mechanism and the cumulative monetary units printed;

control means coupled to said credit register and said printing means for precluding operation of said printing means when said credit register assumes a condition representative of a minimum credit balance;

resetting means coupled to said credit register for resetting said credit register to a condition representative of an increased credit balance;

check acceptance means coupled to said metering mechanism for accepting a check;

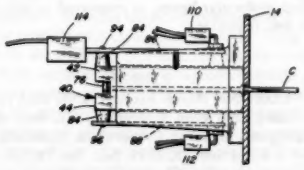
validation means cooperatively associated with said acceptance means and coupled to said resetting means for determining the validity of a check accepted by said acceptance means by sensing a first field encoded with data for resetting said credit register to an increased credit balance and a second field encoded with data keying the check to a specific metering device of a respective check, and in response to said first field and said second field being determined valid rendering said resetting means operable for resetting said credit register to a condition representative of an increased credit balance, and

invalidating means coupled to said resetting means and said check acceptance means for invalidating a check determined valid responsive to said resetting means having been rendered operable and reset said credit register.

4,258,253
CARTRIDGE ASSEMBLY FOR DATA-SENSING SYSTEM

Charles R. Fisher, 34781 Glen Dr., Eastlake, Ohio 44094

Filed Nov. 8, 1979, Ser. No. 92,452
Int. Cl.[3] G06K 7/00, 7/06, 7/08, 7/14
U.S. Cl. 235—439 9 Claims



1. A cartridge assembly adapted for use in a data-sensing system of the type for reading coded information on a data carrier, such as a credit card, security card or other such identification card, comprising:

receptacle means adapted to be mounted on a support means;

cartridge means adapted to be removable inserted into said receptacle means;

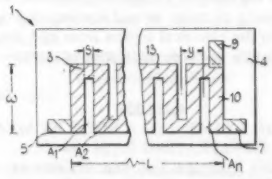
said cartridge means mounting selectively interchangeable electric control circuit means adapted for connection to power means; and

said carriage means adapted to removably receive a data carrier means for automatic electronic read-out upon operably coaction with said cartridge means.

4,258,254
IMAGING DEVICES AND SYSTEMS

Charles T. Elliott, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, England

Filed Apr. 12, 1979, Ser. No. 29,411
Claims priority, application United Kingdom, Apr. 25, 1978, 16279/78
Int. Cl.[3] H01J 40/14
U.S. Cl. 250—211 J 8 Claims



1. An imaging device comprising:

an elongate strip of semiconductor material capable of generating photocarriers when an optical radiation image is focussed thereupon;

first and second current electrodes, spaced apart and situated on the strip, for applying bias current through the strip; and, a read-out electrode situated on the strip between the first and second current electrodes;

wherein the improvement comprises providing in the strip between the first and second current electrodes, barrier means arranged for partially dividing the volume of the strip so that the diffusion of photocarriers in the longitudinal direction, from the first current electrode to the second current electrode, is limited to a spread substantially less than the diffusion length characteristic of the material.

4,258,255
INFRARED INTRUSION DETECTION SYSTEM

John K. Guscott, Lynnfield, Mass., assignor to American District Telegraph Company, New York, N.Y.

Filed Apr. 23, 1979, Ser. No. 32,337
Int. Cl.[3] G01D 21/04
U.S. Cl. 250—221 11 Claims

1. An intrusion detection system comprising:

a housing adapted to be affixed to a mounting surface;

a mirror assembly on said housing including:

an array of plane mirrors having outwardly facing mirror surfaces and each providing a respective field of view for receiving infrared radiation; and

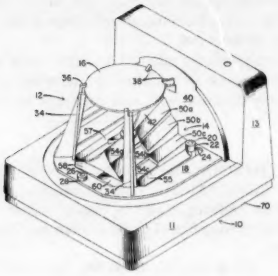
a parabolic mirror having its mirror surface facing away from received infrared radiation and confronting said array of mirrors and operative to focus radiation reflected by said array of plane mirrors;

support means on said housing for support of said parabolic

mirror in predetermined spaced disposition with respect to said array of mirrors;

support means on said housing for providing angularly adjustable support of said array of mirrors in relation to the parabolic mirror;

an infrared detecting element at the focus of the parabolic



mirror and operative to provide electrical signals representative of received infrared radiation;

support means on said housing for support of said detecting element at the focus of the parabolic mirror; and

signal processing circuitry in said housing and operative in response to the electrical signals from said detecting element to provide an output indication of intruder detection.

4,258,256

DEVICE FOR EXAMINING A BODY BY MEANS OF PENETRATING RADIATION

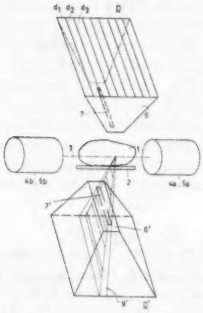
Geoffrey Harding, Rellingen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 971,769

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757320

Int. Cl.[3] **G01N** *23/20;* **G21K** *1/00*

U.S. Cl. 250—272 **4 Claims**



1. In a device for examining a body of the type comprising means for projecting penetrating radiation through the body in a primary beam of small cross-section area, whereby scattered radiation is produced by interaction of radiation in the primary beam with materials in the body, a plurality of radiation detectors, and slit aperture means which function to transmit the scattered radiation from the body to the detectors, the improvement comprising:

laminar radiation absorbing means, disposed between the body and the detectors, which function to transmit scattered radiation, which originates in the region of the primary beam, to the detectors and to attenuate scattered radiation, which originates outside of the primary beam and which propagates towards the detectors.

4,258,257

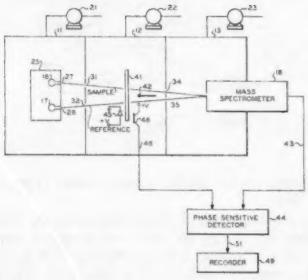
DUAL MOLECULAR BEAM SYSTEM

Richard T. Brackmann, Pittsburgh, Pa., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 30, 1979, Ser. No. 7,746

Int. Cl.[3] **B01D** *59/44*

U.S. Cl. 250—281 **11 Claims**



1. Apparatus comprising:

a mass spectrometer having an inlet;

means for directing a first molecular beam toward the inlet of said mass spectrometer;

means for directing a second molecular beam toward the inlet of said mass spectrometer, said first molecular beam originating from a first source, said second molecular beam originating from a second source which is substantially adjacent said first source, said first molecular beam and said second molecular beam converging at the inlet of said mass spectrometer;

a chopping wheel positioned in the path of said first molecular beam and in the path of said second molecular beam in such a manner that the axis of rotation of said chopping wheel extends generally in the direction of movement of said first molecular beam and said second molecular beam, said chopping wheel having a plurality of equally angularly spaced openings therein with respect to the axis of rotation of said chopping wheel, two of the sides of each of said equally angularly spaced openings being equally angularly spaced with respect to the axis of rotation of said chopping wheel and being along radii projecting from the axis of rotation of said chopping wheel, said chopping wheel being aligned so as to alternately pass said first molecular beam and said second molecular beam through said plurality of equally angularly spaced openings to the inlet of said mass spectrometer;

a beam balance filter means; and

means for positioning said beam balance filter means in the path of said first molecular beam or in the path of said second molecular beam, said beam balance filter means providing a means for making the intensity of said first molecular beam, as measured at said inlet of said mass spectrometer substantially equal to the intensity of said second molecular beam, as measured at said inlet of said mass spectrometer.

4,258,258

CORONA WIRE MOUNTING DEVICE

Jean W. Laing, and Fred F. Hubble, III, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

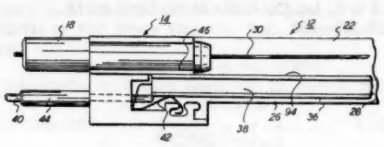
Filed Sep. 28, 1979, Ser. No. 79,758

Int. Cl.[3] **H01T** *19/04*

U.S. Cl. 250—324 **9 Claims**

1. A corona generating device for use with high applied

voltages which comprises a coronode supported between a pair of endblock assemblies, each endblock assembly defining a space for the passage of said coronode from exterior said assembly to the other endblock assembly, and non-conductive inserts removably mounted in said spaces and surrounding said



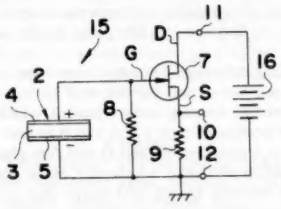
coronode, said inserts being made of a material with high dielectric strength and resistance to corrosive atmosphere to protect said assemblies from the effects of said high applied voltages, and said inserts being separately replaceable from the remainder of said corona generating device when said inserts have been eroded by the effects of said high applied voltages.

4,258,259

INFRARED DETECTOR

Hiroshi Obara, and Tetuaki Kon, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1979, Ser. No. 38,827
Claims priority, application Japan, May 22, 1978, 53-60812
Int. Cl.³ G01J *1/00*; G01T *1/22*
U.S. Cl. 250—338 **14 Claims**



1. A pyroelectric infrared detector comprising an N-type field effect transistor, and a polymeric pyroelectric device having a polymeric pyroelectric member and electrode plates on the both sides of said member, said device being connected so that an electrode plate producing positive charges because of temperature increases resulting from incident infrared radiation is connected to the gate of said transistor.

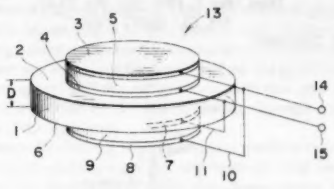
4,258,260

PYROELECTRIC INFRARED DETECTOR

Hiroshi Obara; Tetuaki Kon, and Naohiro Murayama, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1979, Ser. No. 41,066
Claims priority, application Japan, May 31, 1978, 53-73403[U]
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—338 **8 Claims**

1. A pyroelectric infrared detector comprising a substrate and polymeric pyroelectric elements mounted to both surfaces of the substrate, each of said elements having electrode plates provided on both surfaces thereof, in which electrode plates on one of the polymeric pyroelectric elements are electrically connected to the electrode plates of opposite polarities on the other of the polymeric pyroelectric elements respectively, the produce of the modulus of elasticity and the thickness of the substrate being greater by a factor of 5 than the product of the modulus of elasticity and the thickness of each of the pyroelectric elements, whereupon infrared radiation is applied to one of the pyroelectric elements, and said pyroelectric element is prevented from bending and the effects of piezoelectricity



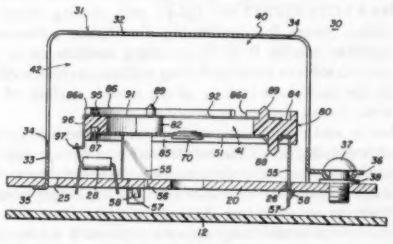
resulting from the compression strains along the thickness of the elements are compensated.

4,258,261

ELECTRODE ASSEMBLY FOR COMBUSTION PRODUCTS DETECTOR

Frederick J. Conforti, Aurora, Ill., assignor to Pittway Corporation, Aurora, Ill.

Filed May 7, 1979, Ser. No. 36,289
Int. Cl.³ H01J *39/28*
U.S. Cl. 250—381 **20 Claims**



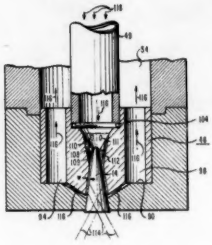
3. An electrode assembly for a combustion product detector which includes means defining a cylindrical ionization chamber having an axis and a first electrode therein and having openings allowing the introduction of ambient air and products of combustion thereinto and a source of radiation disposed within the ionization chamber, said assembly comprising a second electrode mounted in the ionization chamber non-coaxially therewith and spaced from the first electrode and having attachment means, a third electrode disposed in the ionization chamber and having attachment means, and an insulating body having first and second attachment structure respectively disposed on opposite sides thereof, said first and second attachment structure being respectively adapted for press-fitting engagement with the attachment means of said second and third electrodes for secure attachment thereof to said insulating body in an assembled condition wherein said insulating body closes the space between said second and third electrodes around the entire perimeter thereof and maintains said third electrode spaced from said first and second electrodes for cooperation respectively therewith to define a sampling zone and a reference zone within the ionization chamber, said third electrode having a small opening therein providing the sole communication between said reference zone and said sampling zone.

4,258,262

HIGH-POWER X-RAY SOURCE

Juan R. Maldonado, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 3, 1979, Ser. No. 35,472
Int. Cl.[3] H05G 1/02
U.S. Cl. 250—419 3 Claims



1. In combination in a high-power X-ray source,

a hollow metallic stationary cone,

means for bombarding a portion of the inside surface of said cone with electrons to cause the emission of X-rays therefrom,

and means for cooling the outside surface of said cone,

CHARACTERIZED IN THAT said cooling means includes means for establishing a turbulent substantially uniform-velocity flow of a cooling medium along said cone to achieve nucleate boiling without cavitation effects in the immediate vicinity of the outside surface of said cone during electron bombardment,

wherein said cone is mounted apex-up at the bottom of a closed cylindrical chamber defined by a casing, said casing having formed in the interior walls thereof an annular ledge portion that surrounds said cone at a height intermediate the apex and base thereof,

wherein said establishing means comprises a substantially cylindrical diverter element resting on said ledge portion and encompassing, but spaced apart from, a major portion of the top surface of said cone,

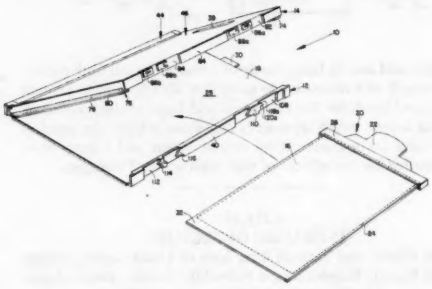
and wherein said diverter element is formed to include a centrally located through passageway symmetrically disposed with respect to the longitudinal axis of said element, said passageway comprising from top to bottom three separate joined compartments: a cylindrical compartment having an annular ledge portion at the bottom thereof, a conical apex-down compartment, and a conical apex-up compartment, said second-mentioned conical compartment being designed to encompass a major portion of said cone in spaced-apart relationship therewith, the sidewalls of said conical compartments including a symmetrical array of channels for uniformly distributing the cooling medium over a portion of the upper surface of said cone, said conical compartments including a channel therebetween symmetrically disposed with respect to the longitudinal axis of said diverter element for distributing the cooling medium over the apex of said cone, and said diverter element further being formed to include plural peripheral channels each extending through the entire longitudinal extent of said diverter element for carrying the cooling medium from said cone into said cylindrical chamber.

4,258,263

CASSETTE FOR LARGE FORMAT FILM UNIT

Daniel A. Buldini, Melrose, and Donald P. Richard, Reading, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 31, 1979, Ser. No. 108,457
Int. Cl.[3] G03D 13/08; G03B 41/18
U.S. Cl. 250—480 17 Claims



1. A cassette for releasably holding a photosensitive film unit and locating the film unit at a film plane therein, said cassette comprising:

a base section including a bottom wall and opposed laterally spaced side walls, said bottom wall having a generally planar interior bearing surface against which at least a marginal portion of such a film unit is to bear in intimate contact to locate the film unit at said film plane;

a cover section including a generally planar top wall and opposed laterally spaced side walls, said cover section being positionable over said base section with their respective side walls in telescoping relation and said bearing surface and said top wall in substantially parallel opposed relation whereby said base and cover sections are movable relative to one another in a direction generally transverse to said film plane between a first closed position, wherein said top wall is spaced from said bearing surface by a given distance and said base and cover sections cooperate to define a light tight cassette housing for holding the film unit therein and having a light sealed passageway at one longitudinal end thereof through which the film unit may be advanced in a direction generally parallel to said film plane to remove the film unit from said housing, and a second closed position wherein said top wall is closer to said bearing surface than when located in said first closed position so that the spacing therebetween is less than said given distance;

means for releasably latching said base and cover sections together in each of said first and second closed positions; and

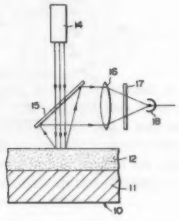
means on the interior of said top wall and operative when said base and cover sections are located in said second closed position for applying sufficient pressure to the film unit to urge at least the marginal portions thereof into intimate contact with said bearing surface and responsive to locating said base and cover sections in said first closed position for reducing said pressure sufficiently to allow the film unit to slide over said bearing surface with minimal friction to facilitate its advancement through said passageway.

4,258,264

METHOD OF AND APPARATUS FOR READING OUT A RADIATION IMAGE RECORDED IN A STIMULABLE PHOSPHOR

Noboru Kotera; Syusaku Eguchi, both of Odawara; Junji Miyahara, Minami-ashigara; Seiji Matsumoto, Minami-ashigara, and Hisatoyo Kato, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 12, 1979, Ser. No. 57,094
Claims priority, application Japan, Jul. 12, 1978, 53-84741
Int. Cl.[3] H05B *33/00*
U.S. Cl. 250—484 4 Claims



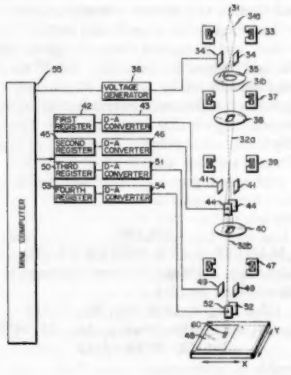
2. An apparatus for reading out a radiation image stored in a stimulable phosphor member comprising a stimulating ray source for generating stimulating rays to which the stimulable phosphor stored with a radiation image is exposed, and a detecting means for detecting the light emitted from the stimulable phosphor stimulated by said stimulating rays characterized in that the wavelength of said stimulating rays generated by the stimulating ray source is within the range of 600 to 700 nm, and that said detecting means detects the light having a wavelength within the range of 300 to 500 nm.

4,258,265

ELECTRON BEAM EXPOSING APPARATUS

Masahiko Sumi, Yokohama, Japan, assignor to Tokyo Shibaura Electric Company, Limited, Kawasaki, Japan

Continuation of Ser. No. 799,997, May 24, 1977. This application Jan. 22, 1979, Ser. No. 5,499
Claims priority, application Japan, May 26, 1976, 51-60175
Int. Cl.[3] A61K *27/02*
U.S. Cl. 250—492 A 3 Claims



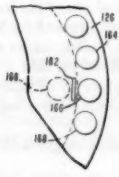
1. An electronic beam exposing apparatus comprising:
a beam source for emitting electron beams;
first beam shaping means for shaping said electron beams into a first pattern, said first beam shaping means comprising a first beam restricting aperture and first means for passing said electron beams through said first aperture such that said first pattern is defined by the beams passing through said first aperture;
second beam-shaping means for shaping said first pattern of electron beams into a second pattern, said second beam-shaping means comprising a second beam restricting aperture and second means for projecting an image of said first pattern against said second aperture, such that said second pattern is defined by the beams passing through said first and second apertures;
drive means for moving a beam incident position relative to the second aperture of the second beam-shaping means to permit the second beam pattern to be regulated by the second aperture; and;
means for illuminating focusing the second beam pattern from the second aperture onto an object to be exposed;
wherein said first and second beam-shaping means, each, are an L-shaped plate.

4,258,266

ION IMPLANTATION SYSTEM

William P. Robinson, Newberry Park, and Robert L. Seliger, Agoura, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jul. 30, 1979, Ser. No. 61,578
Int. Cl.[3] H01J *37/00;* B01D *59/44*
U.S. Cl. 250—492 A 5 Claims



1. An ion implantation system comprising:
A high current separated ion source for producing along a beam path a high aspect ratio ribbon shaped ion beam having a height and a thickness with its height substantially greater than its thickness in a direction perpendicular to ion flow along the beam, said separated ion source including magnetic field means for producing a magnetic field in the direction of the height of the beam across the beam path and first and second separator electrodes positioned on opposite sides of said path laterally of said path in the thickness dimension of the beam for applying an electric field across said path, said separator electrodes being positioned with respect to said magnetic field means so that said electric field is transverse with respect to said magnetic field to separate unwanted ions species laterally from the ion beam to provide an ion beam without scanning deflections;
a wafer wheel positioned in the path of said beam, said wafer wheel being or carrying implantable wafers thereon and being rotatably mounted on an axis substantially parallel to beam path, said wafer wheel being positioned so that the beam leaves a substantially rectangular pattern on the wafer wheel, with the thickness of the beam pattern being substantially radially oriented with respect to the wafer wheel axis and with the height of the pattern being substantially normal to the wafer wheel radius;
means for rotating said wafer wheel about its axis; and
means for traversing said wafer wheel in a direction substantially at right angles to the wafer wheel axis and parallel to the thickness dimension of the beam so that wafers on the wafer wheel can be traversed across the beam pattern while the wafer wheel is rotating.

4,258,267

METHOD AND APPARATUS FOR TESTING THE BASE FOLDS OF OPEN AND FINISHED BASES FORMED ON TUBE SECTIONS

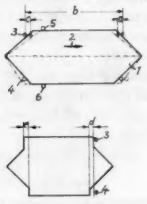
Richard Feldkämper, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Feb. 15, 1979, Ser. No. 12,494

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807842

Int. Cl.³ G01N *21/86*

U.S. Cl. 250—560 **23 Claims**



1. A method of testing the base folds of bases formed on tube sections during the production of sacks or bags, comprising the steps of:

providing a plurality of photocells;

transporting the tube sections in a transverse position past said photocells;

for controlling parts of one of the leading edges, the trailing edges and the folded edges of the bases, placing said one of the leading edges, trailing edges and folded edges of the bases perpendicular to the tube sections;

measuring, via said plurality of photocells, the length of the bases at a predetermined spacing from the tube section parallel thereto;

comparing the measured length with a desired value thereof; and

eliminating the appropriate sack if the measurement differs from the desired value.

4,258,268

POLYCYCLIC PHENOLS, ALCOHOLS AND KETONES FROM PHENOLS, CYCLIC ALCOHOLS AND CYCLIC KETONES USING A NICKEL OXIDE/MANGANESE OXIDE/MAGNESIUM OXIDE CATALYST IN PRESENCE OF AT LEAST ONE OF HYDROGEN AND NITROGEN

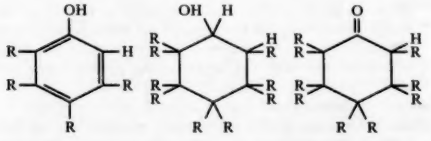
Geir Björnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 27, 1979, Ser. No. 69,966

Int. Cl.³ C07C *27/06, 29/132*

U.S. Cl. 568—350 **21 Claims**

1. A process for the production of at least one of a polycyclic phenol, a polycyclic ketone, and a polycyclic alcohol, which comprises subjecting under hydrogenation conditions at least one of a monocyclic ketone, a monocyclic alcohol and a monocyclic phenol to the action of a catalyst consisting essentially of oxides of nickel, manganese and magnesium wherein the compounds involved can be represented by the formulas



I II III

wherein R can be one of hydrogen, an alkyl radical and a cycloalkyl radical each having from 1 to 6 carbon atoms, inclusive.

4,258,269

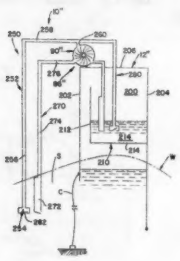
WAVE POWER GENERATOR

Junjiro Tsubota, 2392, Jindaiji-machi, Chofu-shi, Tokyo 182, Japan

Filed May 3, 1979, Ser. No. 35,694

Int. Cl.³ F03B *13/12*

U.S. Cl. 290—53 **12 Claims**



1. A wave energy converter comprising:

a housing located in a body of water in a position to be subjected to wave motion occurring in that body of water, said housing having one end thereof submerged and open to receiver water from the body of water and another end thereof positioned to be above water so that water level within said housing varies as waves pass by said housing;

a container having a reservoir of liquid contained therein, said container being connected to said housing through a spaced portion which defines an air space between said reservoir and the water received in said housing from said body of water;

a water activated energy generating system including a turbine or water wheel attached to said housing, a first intake system having an intake end thereof submerged in said reservoir and another end thereof fluidly connected to said turbine to conduct liquid against a rotor in said turbine for operating said turbine, a first exhaust system fluidly connected to said turbine for removing liquid therefrom, said generating system further including a second intake system having an intake end thereof submerged in said body of water or another reservoir of liquid and another end thereof connected to said turbine to conduct liquid against a rotor in said turbine for operating said turbine, and a second exhaust system fluidly connected to said turbine for removing liquid therefrom;

said first and second intake systems alternately conducting liquid against a turbine rotor in said turbine as waves move past said housing so that said turbine is operated in an essentially continuous manner by impact of liquid against a rotor in said turbine; and

means for withdrawing energy from said turbine.

4,258,270

MARINE WAVE POWER PLANT

Rolf E. A. Törnkvist, Helsinki, Finland, assignor to Salen Energy AB, Stockholm, Sweden

Filed Aug. 9, 1979, Ser. No. 65,154

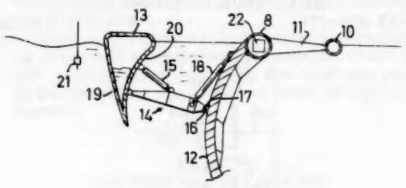
Claims priority, application Sweden, Aug. 22, 1978, 7808856

Int. Cl.³ F03B *13/12*

U.S. Cl. 290—53 **9 Claims**

1. Wave power plant consisting of adjacently arranged basic units with anchoring means, with each basic unit comprising a member movable with the waves, a stationary member cooperating therewith, and a hydraulic-electrical system for converting the movements of the movable member relative to the

stationary member into electrical energy, characterized in that the movable member consists of a displacement body whose front surface, facing the wave front, as it moves makes room for the mass of water which moves with a wave, and as it returns fills up the space freed as the water moves towards the



wave, that the stationary member consists of displacement tubes rigidly joined to each other and with a substantially vertical plate which is sufficiently large and extends to sufficient depth to offer large resistance to movements in the water, and that journalling means are arranged for swingable attachment of the movable member to the stationary member.

4,258,271

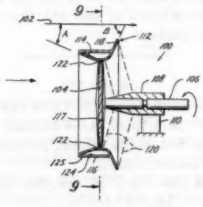
POWER CONVERTER AND METHOD

Walter L. Chappell, and John D. Watts, both of 2836 Delafield, Houston, Tex. 77023

Continuation-in-part of Ser. No. 798,648, May 19, 1977, which is a continuation-in-part of Ser. No. 683,734, May 6, 1976, abandoned. This application Aug. 24, 1978, Ser. No. 936,193

Int. Cl.³ F03D *7/00*

U.S. Cl. 290—54 **5 Claims**



1. A submersible apparatus mounted in open flowing streams of water for use in converting the kinetic energy in flowing water into usable power comprising:

an impeller member moved by the flowing current, said impeller member including a shaft and a plurality of blades mounted with said shaft for enabling the flowing current to strike the blades for rotation of said blades and shaft;

means mounted with said impeller member for converting the movement of said impeller member into electrical or other desirable power;

a housing mounted around and adjacent said impeller member, said housing having an inlet section and outlet section and a body section connecting said inlet and outlet sections and wherein said inlet section is positioned to receive into the impeller substantially all flowing current entering said housing such that the flowing current substantially enters the inlet section free of any restriction such that the current entering the inlet section and the unrestricted flowing current immediately adjacent the outside said inlet section are flowing substantially in a parallel direction and wherein the flowing current outside the inlet section and body section is substantially unrestricted such that the unrestricted flowing current outside said housing and adjacent said inlet and said body section is deflected by an inclined outwardly radially extending wall of said exit section, said wall being at an angle of not less than 35° nor more than 75° relative to the longitudinal axis of said body section such that the previously unobstructed free flowing stream is deflected outwardly away from said body section and said exit section and allowing only the current flowing into the impeller to rejoin the unrestricted flowing current outside said inlet section immediately downstream of said deflection.

4,258,272

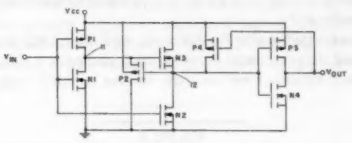
TTL TO CMOS INPUT BUFFER CIRCUIT

Jen-Yen Huang, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 19, 1979, Ser. No. 21,495

Int. Cl.³ H03K *19/08*

U.S. Cl. 307—475 **12 Claims**



1. A TTL to CMOS input buffer integrated circuit, comprising

an input terminal for connection to an output terminal of a TTL device;

a supply terminal;

a ground terminal;

a first CMOS inverter connected to the input terminal, including a first p-channel FET connected to the supply terminal and a first n-channel FET connected to the ground terminal, wherein the drain of the first p-channel FET is connected to the drain of the first n-channel FET at a first node;

a second n-channel FET having its gate connected to the input terminal and its source connected to the ground terminal;

a third n-channel FET having its gate connected to the first node, its drain connected to the supply terminal, and its source connected to the drain of the second n-channel FET at a second node for forcing the potential at the second node to be less than the potential at the first node by the amount of the threshold voltage of the third n-channel FET; and

a second p-channel FET having its gate connected to the second node, its source connected to the first node, its drain connected to the ground terminal, and its substrate connected to the supply terminal for reducing the rate at which the third n-channel FET becomes conductive when gated on in a said integrated circuit in which the threshold of the n-channel FET's is greater than the threshold of the p-channel FET's.

4,258,273

UNIVERSAL REGISTER

Joseph Straznicky, Los Angeles, and Alexander A. Kumjian, San Francisco, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 13, 1978, Ser. No. 960,261

Int. Cl.³ H03K *23/02;* **G11C** *5/00, 15/04*

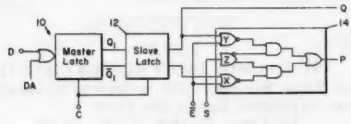
U.S. Cl. 307—221 R **10 Claims**

1. A register adapted for processing applied binary data signals as a function of applied control signals, said register comprising a plurality of bit slices each of which comprises:

a master-slave flip-flop having a master latch circuit adapted for receiving at least one applied data signal and a slave latch circuit coupled in cascade with said master latch circuit and adapted for producing two complementary

output signals that are indicative of the binary state of the applied data signal;

an output control network coupled in cascade with said slave latch circuit and adapted for receiving the applied control signals so as to selectively provide as a function of said control signals, an output signal which is equal to one



of said two complementary output signals from said slave latch circuit or is equal to a predetermined binary signal state; and

wherein said master latch circuit, said slave latch circuit and said output conrol network each comprise a single stage, two decision level cascode, emitter coupled logic circuit.

4,258,274

DOUBLE BALANCE TYPE SWITCHING CIRCUIT

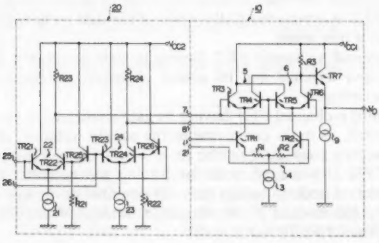
Yoshitake Nagashima, Yokohama; Kazumasa Noyori, Oita, and Hideki Moriyama, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 25, 1978, Ser. No. 945,496

Claims priority, application Japan, Sep. 30, 1977, 52/117547

Int. Cl.³ H03K *17/60*

U.S. Cl. 307—254 **4 Claims**



1. A double balance type switching circuit comprising signal generating means which is provided with first and second output terminals, for sending forth from the first output terminal a first output signal selectively chosen to have either of first and second levels, for sending forth from the second output terminal a second output signal selectively chosen to have the other level, and for effecting level switching operation by (a) first setting the one of the first and second output signals which is at the first level to have the second level while keeping the other of the first and second output signals at the second level and (b) next setting the other of the first and second output signals to have the first level; a first differential amplifier formed of first and second transistors; a second differential amplifier connected between the collector of the first transistor and a power supply terminal, and formed of third and fourth transistors whose bases are respectively connected to the first and second output terminals of the signal-generating means; and a third differential amplifier connected between the collector of the second transistor and the power supply terminal, and formed of fifth and sixth transistors whose bases are respectively connected to the first and second output terminals of the signal-generating means.

4,258,275

MINIATURE ELECTRONIC DEVICE

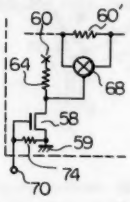
Heihachiro Ebihara, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 10, 1978, Ser. No. 904,711

Claims priority, application Japan, May 13, 1977, 52-54419

Int. Cl.³ H03K *17/51*; G04C *3/00*

U.S. Cl. 307—511 **6 Claims**



1. An adjustment circuit for a miniature electronic device including an external terminal arranged to receive a voltage signal, and a power source having a fixed potential, comprising an adjustment element, a non-volatile semiconductor memory element having a gate electrode, a source electrode and a drain electrode serving as an output, the source electrode of said memory element being connected to the fixed potential of said power source and the gate electrode of said memory element being connected to said external terminal and responsive to said voltage signal to assume one operative state, and a volatile semiconductor switch element having a control terminal connected to the output of said non-volatile semiconductor memory element and opened and closed in response to the memory of said non-volatile semiconductor memory element, said volatile semiconductor switch element having an output terminal connected to one terminal of said adjustment element to control the operation thereof.

4,258,276

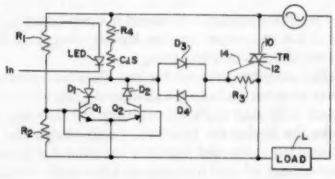
SWITCHING CIRCUIT FOR CONNECTING AN AC SOURCE TO A LOAD

Thomas E. Beling, Saxonville, Mass., assignor to Sigma Instruments, Inc., Braintree, Mass.

Filed Jun. 23, 1978, Ser. No. 918,354

Int. Cl.³ H03K *17/72*

U.S. Cl. 307—252 B **5 Claims**



1. An alternating current switch circuit, comprising a bilateral switch having a control terminal and output terminals, variable impedance means for producing a variable impedance, coupling means coupling said variable impedance means from one of the output terminals to the control terminal for applying the voltage of one of the output terminals to the control terminal so as to turn on the switch when the impedance of the impedance means is lower than a given value, input means coupled to the variable impedance means for varying the impedance to a given value to turn on the switch, voltage sensing means for sensing voltages, bilateral switching means for exhibiting a high impedance when turned off and a low impedance when turned on, said bilateral switching means connecting said impedance means to the other terminal and being connected to said voltage sensing means while said

voltage sensing means is connected across the output terminals so that when the sensing means senses a value higher than a given value, said sensing means turns on said bilateral switching means and disables said bilateral switch,

said bilateral switching means including parallel current paths, and complementarily poled transistors each in one of said paths, said transistors having bases connected to said sensing means,

each of said paths including a diode in series with the transistor of said path and poled with the transistor of said path, said coupling means including a pair of inverse parallel diodes connecting said impedance means to said control terminal.

4,258,277

DISCRIMINATOR CIRCUITS

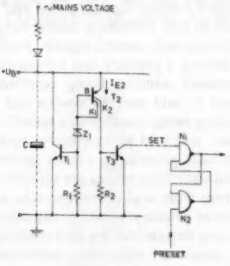
Karl-Diether Nutz, Oedheim, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 26, 1979, Ser. No. 24,078

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1978, 2813073

Int. Cl.³ H03K *5/153;* H03L *5/00*

U.S. Cl. 307—350 **5 Claims**



1. A discriminator circuit arranged to emit a defined output signal when a certain value of a variable direct supply voltage is reached, said discriminator circuit comprising a current mirror circuit connected to the supply voltage source and arranged to divide an input current into two current branches, a limiter circuit arranged in one current branch to limit rise in the supply voltage to a predetermined maximum value and a switching element arranged in the other current branch for emitting an output signal from said discriminator circuit.

4,258,278

LINEAR INDUCTION MOTOR

Alexandr D. Popov, prospekt Koroleva, 12, kv. 154; Vladimir A. Solomin, ulitsa Dachnaya, 14, kv. 31, and Vladimir M. Mindin, prospekt Voroshilovsky, 50, kv. 165, all of Rostov-na-Donu, U.S.S.R.

Filed Oct. 24, 1979, Ser. No. 87,955

Claims priority, application U.S.S.R., Mar. 21, 1979, 2733300

Int. Cl.³ H02K *41/00*

U.S. Cl. 310—13 **1 Claim**

1. A linear induction motor comprising:

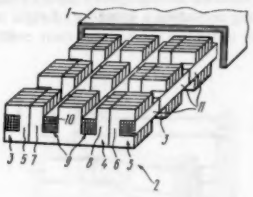
a current-conducting secondary element having a longitudinal axis and being U-shaped in cross-section;

an inductor disposed inside said current-conducting secondary element;

laminated U-shaped cores of said inductor, each having a yoke, said cores being disposed in two rows so that said yokes of said laminated U-shaped cores of said first row face said yokes of said laminated U-shaped cores of said second row;

laminated E-shaped cores of said inductor, each having two outermost legs and being disposed between respective ones of said laminated U-shaped cores of said first row and second rows so that they directly adjoin by their outermost legs to the yokes of said laminated U-shaped cores;

polyphase windings of said inductor made up of two parts each having coils disposed symmetrically relative to said



longitudinal axis of said current-conducting element and encompassing respective outermost legs of said laminated E-shaped cores and respective yokes of said laminated U-shaped cores which are juxtaposed to the outermost legs.

4,258,279

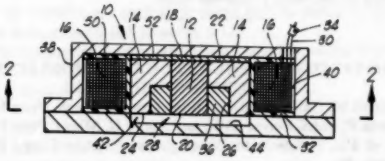
MAGNETIC SENSOR ASSEMBLY

Jiri J. Hovorka, Muskogee, Okla., assignor to Orin W. Coburn

Filed Sep. 5, 1978, Ser. No. 939,446

Int. Cl.³ H02K *21/44*

U.S. Cl. 310—155 **9 Claims**



1. A magnetic sensor assembly comprising:

a permanent magnet having a first end of first polarity and a second end of second polarity;

a pole extension magnet having an axial recess formed therein for receiving the permanent magnet with a first end of the pole extension magnet engaging a portion of the permanent magnet generally near the first end of the permanent magnet, and a second end of the pole extension magnet enclosing a portion of the permanent magnet generally near the second end of the permanent magnet at a spaced distance therearound, the second end of the pole extension magnet and the second end of the permanent magnet being substantially coplanar; and

a pick-up coil disposed coaxially around a portion of the periphery of the pole extension magnet and linked thereto via the magnetic flux emanating therefrom, the pick-up coil providing output signals proportional to variations in said magnetic flux.

4,258,280

SUPPORTING STRUCTURE FOR SLOW SPEED LARGE DIAMETER ELECTRICAL MACHINES

Mihailo Starcevic, Mellingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

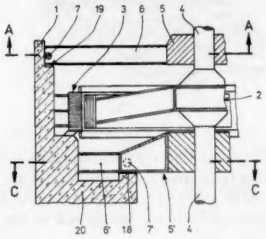
Continuation of Ser. No. 630,017, Nov. 7, 1975, abandoned. This application Dec. 23, 1977, Ser. No. 863,745

Int. Cl.³ H02K *27/04*

U.S. Cl. 310—157 **17 Claims**

1. An arrangement for mounting the stator and rotor of a rotary electrical machine of the vertical axis type having a form which is generally rotationally symmetrical, said arrange-

ment comprising an outer ring rigid and fixedly secured and two axially spaced inner rings, said outer ring supporting the machine stator and said two axially spaced inner rings arranged concentrically within said outer ring and supporting the machine rotor, means for interconnecting said outer ring with each of said two axially spaced inner rings, said means for interconnecting including a plurality of rigid rectilinear arms which remain inflexible throughout their entire length when



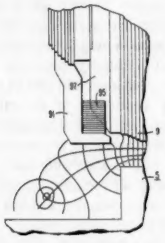
subjected to load, all of said rigid rectilinear connecting arms associated with one of said axially spaced inner rings forming identical acute angles both with respect to radial lines directed from the center of said one of said two axially spaced inner rings through respective junction points with said one of said two axially spaced inner rings and with respect to lines tangent to a circle at the respective junction points, said arms being inclined in the same rotational sense.

4,258,281

LAMINATED FLUX SHUNT FOR DYNAMOELECTRIC MACHINE STATOR

Raymond M. Calfo, Bradock Hills; Arthur Mulach, Penn Hills; Frank P. Fidei, Forest Hills, and James G. Minto, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 17, 1979, Ser. No. 67,249
Int. Cl.³ H02K *1/12*
U.S. Cl. 310—256 **6 Claims**



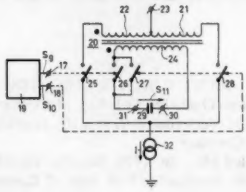
1. An improved dynamoelectric machine having a stator with a plurality of laminations forming a core and a rotor disposed within the core with a gap therebetween, wherein the improvement comprises flux shunts disposed on both ends of said stator, each of said flux shunts comprising a set of generally "L" shaped laminations disposed generally perpendicular to the core laminations disposed in such a manner that the base of the "L" is directed toward the core laminations and is adjacent the rotor, the stem of the "L" extending radially outwardly, and a set of generally "U" shaped laminations disposed on the base of the "L" shaped laminations normal to the L shaped laminations and normal to the core laminations to reduce leakage flux entering the core normal to the plane of the core laminations.

4,258,282

DEVICE FOR THE GENERATION OF A CONTROL VOLTAGE ACROSS A PIEZO-ELECTRIC POSITIONING ELEMENT

Albert M. A. Rijckaert, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 21, 1979, Ser. No. 41,022
Claims priority, application Netherlands, May 29, 1978, 7805804
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—317 **7 Claims**



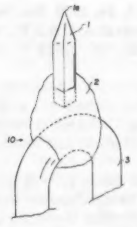
1. A device for the generation of a control voltage across a piezo-electric positioning element comprising means for generating pulse-shaped control signals; a first and a second switching means, each of said switching means having control input means for receiving said control signals; a current source; and a transformer having a primary and a secondary winding, said transformer primary winding being coupled by said second switching means to said current source and said transformer secondary winding being coupled in a serial loop with said first switching means and said piezo-electric positioning element; whereby when said generating means generates control signals, said second switching means are selectively actuated such that a first current from said current source is allowed to flow in said transformer primary winding, the direction of said first current flow being determined by said control signals, and said first switching means are selectively actuated such that a second current, induced in said transformer secondary winding, is allowed to proportionately charge or discharge said piezo-electric positioning element, depending upon the direction of said second current flow which in turn is dependent on the direction of said first current flow, and when said generating means ceases to generate control signals, said first and said second switching means are deactuated thereby stopping the flow of said second and said first currents, respectively.

4,258,283

CATHODE FOR ELECTRON EMISSION

Wilhelm Brünger, and Gottfried Möllenstedt, both of Tübingen, Fed. Rep. of Germany, assignors to Balzers Aktiengesellschaft für Hochvakuumtechnik und Dünne Schichten, Liechtenstein

Filed Aug. 31, 1978, Ser. No. 938,333
Int. Cl.³ H01J *1/16, 19/10*
U.S. Cl. 313—336 **1 Claim**



1. A cathode assembly for electron emission, comprising: a heatable support of a high temperature resistant wire; a rod-shaped emitter body of solid lanthanum hexaboride; and an

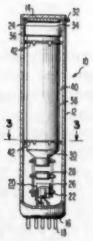
auxiliary body having a surface contact with both the support and the emitter body and being made of sintered tantalum carbide; said auxiliary body embracing said emitter body along a portion of the length thereof at one end of said emitter body which is embedded in said auxiliary body; the surface contact area between said auxiliary body and said support amounting to at least 1/6 of the surface area of said emitter body and said auxiliary body and said emitter body have a surface contact area therebetween amounting to at least 1/6 of the surface area of said emitter body.

4,258,284

ELECTRON TUBE HAVING ELECTRODE CENTERING MEANS

Alfred Month, and Donald B. Kaiser, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 28, 1979, Ser. No. 16,109
Int. Cl.³ H01J *29/02, 29/82, 31/38*
U.S. Cl. 313—390 **10 Claims**



1. In an electron tube of the type including an evacuated envelope having a cylindrical inner surface,

a faceplate closing one end of said envelope,

an electron gun disposed at an end of said envelope opposite said faceplate,

a tubular electrode contained within said envelope and spaced from the cylindrical inner surface thereof, said electrode having an enlarged, elongated cylindrical portion disposed between said electron gun and said faceplate for passing an electron beam therethrough, and means for supporting said electrode in said envelope, the improvement wherein said supporting means comprises:

a centering ring having a plurality of centering sectors defining a centering circumference, the diameter of said circumference being less than, but formed closely to, the diameter of the cylindrical inner surface of said envelope;

means for attaching the centering ring to an outer surface of said electrode in at least two places between the ends of and surrounding said electrode so that the centering circumference is substantially concentric with the outer surface of said electrode; and

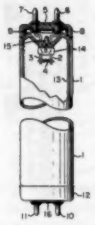
means for resiliently fitting said electrode with said attached centering ring to the inner surface of said envelope so that the concentricity of the outer surface of said electrode to the inner surface of said envelope is determined by the spacing between said centering circumference and the inner surface of said envelope, said fitting means being formed to flexibly contact the inner surface of said envelope.

4,258,285

TWO-COMPONENT PHOSPHOR IN A COOL WHITE LAMP

Charles F. Chenot, Towanda, Pa., and Donald R. Castle, Manchester, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 22, 1979, Ser. No. 51,306
Int. Cl.³ H01J *61/44*
U.S. Cl. 313—487 **2 Claims**



1. A fluorescent lamp comprising a light-transmitting envelope having electrodes, an inert ionzable gas and a charge of mercury therein and a coating of phosphor on the inner surfaces of said envelope, said phosphor consisting essentially of from about 0.2% to about 70% by weight of a blue emitting phosphor composition of the formula

$$Ba_wMg_xEu_yAl_{11}O_{16.5+w+x+y}$$

wherein w and x are each from about 0.05 to about 1.2 and y is from about 0.025 to about 0.125

and the balance is a yellow emitting phosphor of the formula

$$Ca_{5-w-x-y}Cd_wMn_xSb_y(PO_4)_3F_{1-y-a}Cl_aO_y$$

wherein

a is from about 0.005 to about 0.02

w is from 0 to about 0.05

x is from about 0.13 to about 0.17

y is from about 0.02 to about 0.04

said lamp having an emission yielding chromaticity coordinates that fall within the cool white ellipse.

4,258,286

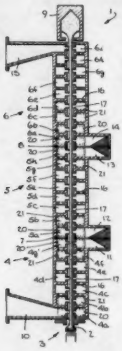
COUPLED CAVITY TYPE TRAVELING WAVE TUBE

Takao Kageyama, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1979, Ser. No. 57,348
Claims priority, application Japan, Jul. 14, 1978, 53/86252
Int. Cl.³ H01J *25/34*
U.S. Cl. 315—3.6 **4 Claims**

1. A coupled cavity type traveling wave tube comprising an electron gun for projecting an electron beam along a path at least one input slow-wave circuit and an output slow-wave circuit arranged along said electron beam path, each of said slow-wave circuits including at least one matching cavity disposed at one end of the respective circuit, at least one matching cavity disposed at the other end of the respective circuit and at least two main cavities interposed between said matching cavities, said tube further comprising a layer of high resistance metal coating at least a portion of the inner walls of at least one matching cavity at opposite ends of said input slow-wave circuit, at least a portion of the inner walls of a

matching cavity at the end closer to the electron gun of said output slow-wave circuit and at least a portion of the inner



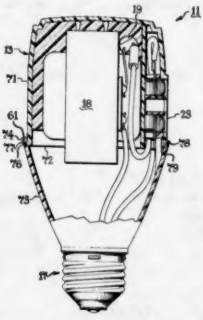
walls of half or less of the main cavities adjacent to said matching cavity of said output slow-wave circuit.

4,258,287

CIRCULAR FLUORESCENT LAMP UNIT

Frederick Hetzel, Brookpark, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 13, 1979, Ser. No. 47,986
Int. Cl.[3] H01J *7/44, 17/34, 19/78;* **H01K** *1/62*
U.S. Cl. 315—58 **8 Claims**



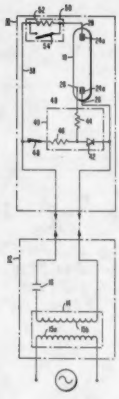
1. A hub for a circular lamp unit, said hub containing ballast means and electrical wiring and comprising a pair of housing members each having a planar rim of approximately the same size and configuration, one of said housing members being provided with an outwardly extending ridge on the outer surface thereof at or near and parallel to the rim thereof and the other of said housing members being provided with a groove on the inner surface thereof adjacent and parallel to the rim thereof, said pair of housing members being joined together by the fitting of said ridge into said groove and providing a housing for said ballast means and electrical wiring.

4,258,288

RESISTOR-AIDED STARTING OF METAL HALIDE LAMPS

Jacob F. Michael, Paramus, and Daniel A. Larson, Cedar Grove, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 9, 1979, Ser. No. 37,582
Int. Cl.[3] H01J *7/44, 17/34, 19/78, 29/96*
U.S. Cl. 315—60 **6 Claims**



1. A metal halide high-intensity discharge lamp for connection to a constant wattage-type mercury ballast including a transformer having a primary winding and a secondary winding, said secondary winding having capacitor means in series circuit arrangement therewith, said lamp comprising:

an elongated radiation-transmitting arc tube enclosed by and supported within a protective outer envelope, said arc tube enclosing a discharge-sustaining filling and having operating electrodes operatively positioned therein proximate the ends thereof and a starting electrode positioned in close proximity to one of said operating electrodes;

electrical lead-in means sealed through said arc tube and connected to said operating electrodes;

electrical adapter means affixed to the outer surface of said protective envelope to facilitate electrical connection of said lamp to a source of electrical power, said electrical adapter means comprising a metallic shell portion and a metallic eyelet separated by an electrical insulating means;

elongated conductor means electrically connecting the other of said operating electrodes to said shell portion;

starting aid means positioned within said protective outer envelope comprising diode means connected in circuit between said one operating electrode and said starting electrode, first resistor means connected in circuit between said starting electrode and said diode means, and second resistor means connected in circuit between said diode means and said elongated conductor means;

normally closed temperature responsive switch means connected in circuit between said second resistor means and said elongated conductor means and positioned in close proximity to said arc tube to cause said normally closed switch means to open when said normally closed switch means is heated by said arc tube during normal lamp operation;

warm-up assistance means positioned within said protective outer envelope comprising third resistor means connected in circuit between said other operating electrode and said shell portion, and normally open heat responsive switch means positioned in close proximity to said arc tube and connected in parallel circuit arrangement with said third resistor means, whereby said third resistor means reduces the phase shift between the voltage of said lamp and the

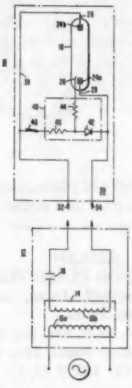
open circuit voltage of said ballast thereby increasing the maximum sustaining voltage to said lamp when the lamp current is zero.

4,258,289

METAL HALIDE LAMP FOR OPERATION WITH A MERCURY BALLAST

Jacob F. Michael, Paramus, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 9, 1979, Ser. No. 37,583
Int. Cl.[3] H01J 7/44, 17/34, 19/78, 29/96
U.S. Cl. 315—60 3 Claims



1. In combination with a metal halide high-intensity discharge lamp for connection to a constant wattage-type mercury ballast, including a transformer having a primary and a secondary, said secondary having a capacitor means in series circuit arrangement therewith, said lamp comprising:

an elongated radiation-transmitting arc tube which is enclosed by and supported within a light-transmitting protective outer envelope, said arc tube enclosing a discharge-sustaining filling and having operating electrodes operatively positioned therein proximate the ends thereof and a starting electrode positioned in close proximity to one of said operating electrodes, electrical lead-in means sealed through said arc tube and connected to said operating electrodes, electrical adaptor means affixed to the outer surface of said protective envelope to facilitate electrical connection of said lamp to a source of electrical power, said electrical adaptor means comprising a metallic shell portion and a metallic eyelet separated by an electrical insulating means, elongated conductor means electrically connecting said other operating electrode to said shell portion, starting aid means positioned within said outer envelope comprising diode means connected in circuit between said one operating electrode and said starting electrode, first resistor means connected in circuit between said starting electrode and said diode means and second resistor means connected in circuit between said diode means and said elongated conductor means, the improvement which comprises:

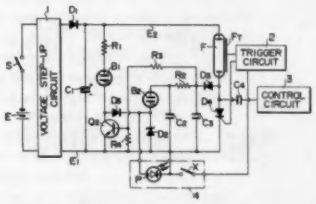
normally closed temperature responsive switch means connected in circuit between said second resistor means and said elongated conductor means and positioned in close proximity to said arc tube to cause said switch means to open when said switch means is heated by said arc tube during normal lamp operation, whereby after said lamp is normally operating, said temperature responsive switch means opens and disconnects said starting aid means to prevent voltage stress of said diode means thereby minimizing electrolysis of said electrical lead-in means.

4,258,290

OPERATION INDICATOR FOR AUTO-STROBO UNIT

Yukio Nakajima, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 10, 1979, Ser. No. 37,653
Claims priority, application Japan, Jul. 28, 1978, 53-10370[U]
Int. Cl.[3] H05B 41/32
U.S. Cl. 315—135 6 Claims



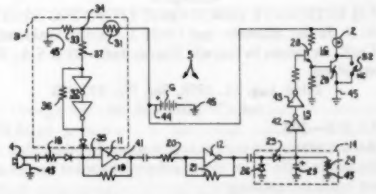
1. An operation indicator for an auto-strobo unit comprising a flash discharge tube, a main capacitor for supplying power to said flash discharge tube, a charging complete indicator circuit for detecting and indicating that the voltage across the main capacitor has reached a given level, a control circuit responsive to a proper amount of exposure for producing an illumination interrupt signal, a flashlight illumination complete indicator circuit responsive to said interrupt signal, a single light emitting element responsive to respective signals from the individual indicator circuits for indicating the completion of a charging operation and the completion of a flashlight illumination, and a bypass circuit which is responsive to the interrupt signal from the control circuit for disabling any current flow from the charging complete indicator circuit to the light emitting element, thus allowing an indication of the completion of a flashlight illumination to predominate over the indication of the completion of a charging operation.

4,258,291

SMOKE ALARM ACTIVATED PORTABLE LAMP

Robert J. Scott, 68A Lake Tapawingo, Blue Springs, Mo. 64015, and Bryant F. Craig, Richardson, Tex., assignors to Robert J. Scott, Blue Springs, Mo.

Filed Nov. 1, 1978, Ser. No. 956,585
Int. Cl.[2] H05B 37/02
U.S. Cl. 315—156 10 Claims



1. A portable lamp activated by the sound signal of a smoke alarm comprising:

(a) a frequency selective microphone;

(b) a light bulb;

(c) a battery;

(d) circuit means interconnecting said microphone, light bulb, and battery and responsive to the sound signal of a smoke alarm device to effect illumination of said light bulb;

(e) a portable housing with said microphone, light bulb, battery, and circuit means mounted thereon; and

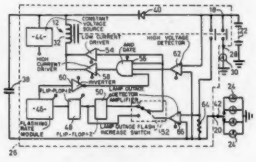
(f) light activated switch means connected to said circuit means and rendering said circuit means unresponsive to said sound signal during illumination of said light activated switch means to thereby conserve battery power.

4,258,292

FLASHER DEVICES FOR LAMPS

Hillar Kassfeldt, Burlington, Canada, assignor to Tridon Limited, Burlington, Canada

Filed Apr. 27, 1979, Ser. No. 34,455
Int. Cl.³ H05B *41/30, 41/34*
U.S. Cl. 315—200 A **13 Claims**



1. A flasher device for lamps and of the two-terminal type comprising:

(a) first and second device terminals for connection respectively to a power source and to a lamp to be flashed by the device;

(b) relay means having a pair of relay terminals that are connected between the first and second device terminals for the passage of lamp lighting current from the first to the second device terminals; and

(c) electronic timing circuit means connected to the relay means and determining the duty cycle period for which the relay terminals are connected and disconnected upon closure of a lamp actuating switch of a flasher circuit in which the flasher device is connected;

(d) the device including a capacitor connected to the first device terminal for supply of charging current thereto upon closure of the lamp actuating switch and during an initial inhibit period of the duty cycle period while the relay terminals are disconnected;

(e) the capacitor being connected to the relay means at the end of the initial inhibit period for supply of holding current thereto for holding the relay terminals connected after they have been connected; and

(f) the capacitor being connected to the timing circuit means for supply of operating current thereto at least while the relay terminals are connected.

4,258,293

HIGH INTENSITY DISCHARGE LIGHTING SYSTEM

Harold R. Judge, Alameda, and Linda J. Harger, Oakland, both of Calif., assignors to Cosmos Energy Innovation S.A., Sierre, Switzerland

Filed Aug. 11, 1978, Ser. No. 932,928
Int. Cl.³ H05B *37/00*
U.S. Cl. 315—203 **6 Claims**

1. An apparatus for connecting a space lighting high intensity discharge light to an electrical outlet socket for an incandescent light, comprising:

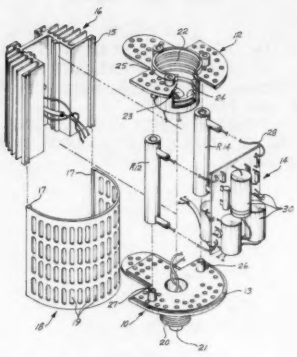
(a) a first end plate having an electrical plug extending therefrom adapted to be electrically connected to said electrical outlet socket;

(b) a second end plate spaced apart from said end plate and having an electrical socket therein adapted to provide an electrical connection to a high intensity discharge light;

(c) a circuit board containing a high intensity discharge light electrical circuit thereon adapted to electrically connect said socket to said plug, said circuit board being disposed between said first end plate and second end plate and secured therebetween;

(d) a heat sink means positioned laterally adjacent said circuit board and extending axially between said end plates; and

(e) a cover means having a plurality of vent means therein, said cover means being positioned laterally adjacent said circuit board extending between said end plates such that



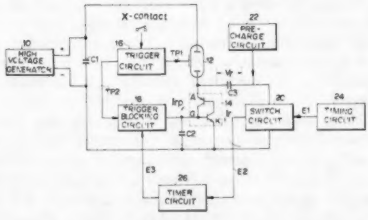
said cover means, said end plates, and said hearsink form a protective enclosure for said circuit board.

4,258,294

CONTROL CIRCUIT FOR FLASH TUBE APPARATUS

Masafumi Yamasaki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1979, Ser. No. 25,881
Claims priority, application Japan, May 12, 1978, 53-56830
Int. Cl.³ H05B *41/32*
U.S. Cl. 315—151 **7 Claims**



1. A control circuit for a flash light apparatus comprising

(a) a charge capacitor charged by a high voltage generator;

(b) a flash tube coupled in parallel with the charge capacitor;

(c) a thyristor whose anode to cathode path being connected between the discharge capacitor and the flash tube for controlling the flash tube in ON-OFF fashion;

(d) a trigger circuit coupled with a trigger electrode of the flash tube and gate of the thyristor to trigger the flash tube and thyristor;

(e) a commutation capacitor coupled in parallel with the anode and cathode of the thyristor;

(f) a precharge circuit for precharging the commutation capacitor;

(g) a switch circuit connected between the commutation capacitor and the thyristor, said switch circuit being such that when it is rendered ON it causes a reverse voltage resulting from a charge stored in the commutation capacitor to be connected parallel with the thyristor to permit the thyristor to be turned OFF;

(h) a timing circuit for turning the switch circuit ON;

(i) a carrier recombination capacitor connected in parallel with the gate and cathode of the thyristor to reduce the turn-OFF time;

(j) a trigger blocking circuit connected between the trigger

circuit and the gate of the thyristor to prevent a trigger signal supplied to the gate of the thyristor; and

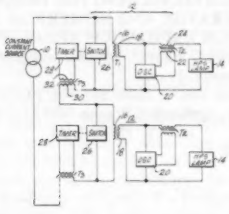
(k) a timer circuit connected between the switch circuit and the trigger blocking circuit to prevent a supply of said trigger signal to said gate of the thyristor during a predetermined trigger signal blocking period, said predetermined trigger signal blocking time substantially corresponding to a period from the turning ON of said switch circuit until said commutation capacitor is substantially discharged.

4,258,295

TIMED BALLAST CIRCUIT FOR SODIUM VAPOR LAMP

John V. Siglock, Sierra Madre, Calif., assignor to Unicorn Electrical Products, Anaheim, Calif.

Filed Nov. 5, 1979, Ser. No. 91,539
Int. Cl.³ H05B *41/231, 41/36*
U.S. Cl. 315—189 **11 Claims**



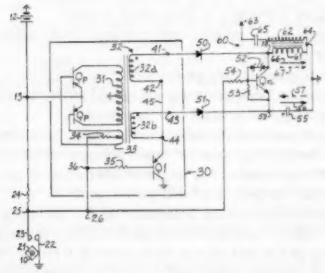
1. A ballast circuit for operating a sodium vapor lamp from a constant current alternating voltage source comprising: a ballast transformer having a primary winding connected to said source and secondary winding connected across the lamp, a high voltage pulsing circuit connected across the secondary winding for pulsing the lamp when the voltage across the secondary winding is above a predetermined level, a switching element for connecting a low resistance load across the primary winding, means for closing the switching element when voltage is initially applied to the primary of the ballast transformer from said voltage source, and timing means for opening the switching element after a predetermined time interval.

4,258,296

INDUCTIVE-CAPACITIVE CHARGE-DISCHARGE IGNITION SYSTEM

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed May 31, 1979, Ser. No. 44,301
Int. Cl.³ H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **11 Claims**



1. An inductive-capacitive charge-discharge ignition system with first and second modes of operation, said system having at least one igniter for creating an electrical arc during each second mode, comprising the combination of:

an ignition transformer having a single primary winding, said primary winding having a first terminal and a second terminal;

a capacitor having a first terminal and a second terminal, the second terminal of the primary winding being connected to the second terminal of the capacitor;

power means, coupled to the first terminal of the primary winding and the first terminal of the capacitor, for independently charging said primary winding and capacitor during the first mode, the charging currents in the primary winding and capacitor being in a first direction;

electronic switching means, bridging said first terminals, for establishing an electrically conductive path between said first terminals during the second mode thereby initiating a discharge current from the primary winding in said first direction and initiating a discharge current from said capacitor in a second direction opposite to the first direction so as to add the initiated discharge currents; and

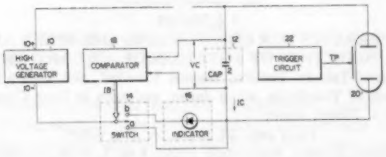
timing means, coupled to the power means and electronic switching means, for activating the power means during the first mode and for activating said electronic switching means during the second mode.

4,258,297

VOLTAGE INDICATOR FOR A STROBOSCOPE

Yukio Nakajima, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1979, Ser. No. 24,570
Claims priority, application Japan, Apr. 24, 1978, 53-48503
Int. Cl.³ H05B *41/32*
U.S. Cl. 315—241 P **10 Claims**



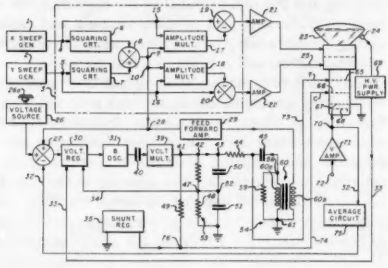
1. A voltage indicator for a stroboscope which comprises a high voltage generator, a discharge capacitor operatively connected to said generator so as to be adapted to be charged with a charge current supplied from the high voltage generator, a flash tube operatively connected to said capacitor so as to be adapted to be impressed with voltage stored in the discharge capacitor, and a trigger circuit for triggering the flash tube, display means connected in series with a circuit of the charge current; switch means connected to the display means to selectively provide a first condition in which the charge current is prevented from flowing into the display means and a second condition in which the charge current is supplied to said display means; comparison means for comparing the charged voltage and a predetermined voltage, said comparison means being designed to supply a selection signal to the switch means in order to cause said switch means to selectively provide the first condition when the charged voltage falls short of the predetermined voltage and the second condition where the charged voltage has a higher level than the predetermined voltage.

4,258,298

DYNAMIC FOCUS CONTROL AND POWER SUPPLY FOR CATHODE RAY TUBE DISPLAYS

Hugh C. Hilburn, Glendale, and Thomas W. Spilsbury, Phoenix, both of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 28, 1979, Ser. No. 107,986
Int. Cl.³ H01J *29/58*
U.S. Cl. 315—382 **12 Claims**



1. In a display employing a cathode ray beam tube device including first and second beam deflection means and at least cathode means, focusing electrode means, and control electrode means:

first circuit means generating first and second electrical signals for respectively energizing said first and second beam deflection means,

video input means for controlling said cathode means,

second circuit means responsive jointly to said first and second electrical signals,

first algebraic summation means responsive to said video input means and to said second circuit means,

low pass filter means responsive to said first algebraic summation means for producing a first output, and

high pass filter means responsive to said first circuit means for producing a second output,

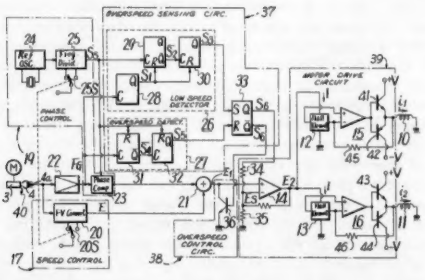
said focusing electrode means being responsive to said first and second outputs.

4,258,299

APPARATUS FOR CONTROLLING THE SPEED AND DIRECTION OF ROTATION OF A DC MOTOR

Masashi Takeda, Isehara; Susumu Hoshimi, and Toshio Sato, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 26, 1979, Ser. No. 6,906
Claims priority, application Japan, Feb. 1, 1978, 53/10170
Int. Cl.³ H02P *6/02*
U.S. Cl. 318—258 **16 Claims**



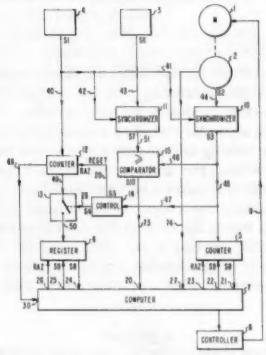
1. Apparatus for controlling the application of driving power to a DC motor so as to maintain a predetermined motor speed in a selected direction comprising: first detector means for detecting a first motor speed which exceeds said predetermined motor speed by a predetermined amount in either said selected direction or the opposite direction, power removing means for removing all of said driving power from said DC motor in response to detection of said first motor speed by said first detector means whereby the motor slows down, said power removing means being effective to maintain said driving power removed from said motor as the latter slows down below said first motor speed detected by said first detector means, second detector means for detecting a second motor speed which is less than said predetermined motor speed, said power removing means being further effective to restore said driving power to said DC motor in response to detection by said second detector means of said second motor speed in the selected or opposite direction as said motor slows down for driving said DC motor in said selected direction.

4,258,300

APPARATUS FOR MEASURING THE FREQUENCY OF A PULSE-GENERATOR AND NUMERICAL CONTROL SYSTEM USING SUCH APPARATUS

Jacques L. Fromont, Vanves, France, assignor to Jeumont-Schneider, Puteaux, France

Filed Feb. 7, 1979, Ser. No. 10,114
Claims priority, application France, Mar. 22, 1978, 78 08328
Int. Cl.³ H02P *5/16*
U.S. Cl. 318—318 **9 Claims**



1. In an apparatus for measuring the frequency of a series of pulses derived from a pulse generator, the apparatus including a fast clock for generating a fast clock signal, first counter means for counting the pulses from said generator, and second counter means for counting said fast clock signal during successive periods of said pulses; the combination of:

a slow clock providing a slow clock signal;

register means for accumulating counts from said second counter means;

means responsive to said pulses for transferring the contents of said second counter means into said register means and for resetting said second counter means;

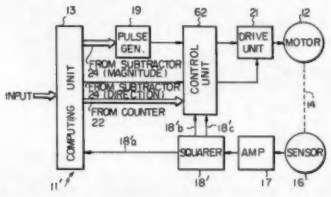
comparator means responsive to said slow clock signal and to said series of pulses for establishing a measuring time interval representing the larger of the period of said clock signal and the period of said pulses; and

means responsive to said time interval for initiating operation of said first counter means and said register means, for deriving at the end of said time interval a count N1 from said first counter means and a count N2 from said register means, and for computing with the derived counts N1 and N2 the ratio N1/N2 as a measure of the frequency of said pulses.

4,258,301
SERVO MOTOR APPARATUS

Ryuichi Kawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 13, 1978, Ser. No. 951,275
Claims priority, application Japan, Oct. 21, 1977, 52-127038; Oct. 21, 1977, 52-127039
Int. Cl.³ G05B *11/18*
U.S. Cl. 318—594 **15 Claims**



1. A servo motor apparatus including a servo motor having a shaft and drive means for energizing the motor to rotate the shaft, characterized by comprising:

sensor means for sensing displacement of the shaft from the command position;

first control means for controlling the drive means to energize the motor to rotate the shaft from an initial position toward the command position; and

second control means for controlling the drive means to energize the motor to rotate the shaft toward the command position when the sensor means senses displacement from the command position in excess of a first predetermined distance;

the sensor means being constructed to actuate only the first control means when the shaft is between the initial position and a second predetermined distance from the command position and to actuate only the second control means when the shaft is within the second predetermined distance from the command position, the second predetermined distance being larger than the first predetermined distance.

4,258,302
APPARATUS FOR MAINTAINING SYNCHRONISM OF AN INVERTER-SYNCHRONOUS MACHINE DRIVE SYSTEM AT LIGHT OR ZERO MACHINE LOADS

Allan B. Plunkett, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

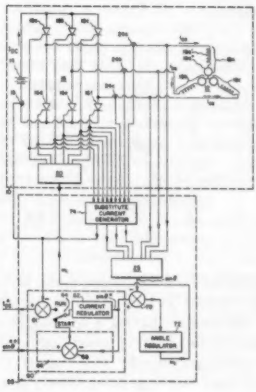
Filed Sep. 28, 1979, Ser. No. 79,693
Int. Cl.³ H02P *5/34, 5/36, 7/42*
U.S. Cl. 318—723 **8 Claims**

1. For use with an inverter-synchronous machine drive system, responsive to operator commands and comprised of a synchronous machine and an inverter configured of a plurality of pairs of solid state switching devices, the switching devices of said pairs of solid state switching devices coupled in series aiding fashion and each of said pairs of solid state switching devices coupled across a unidirectional current source and coupled at the junction between switching devices to a respective synchronous machine phase for supplying current to said synchronous machine when the solid state switching devices are rendered conductive in a predetermined sequence, apparatus for controlling the conduction frequency of solid state switching devices responsive to said operator commands for achieving inverter-synchronous machine synchronism and for maintaining inverter-synchronous machine drive synchronism at light or zero machine load conditions, said apparatus comprising:

first circuit means coupled to said inverter and adapted to be supplied with a parameter command signal proportional to an operator-commanded inverter-synchronous machine drive system parameter magnitude and with a fixed-value phase angle signal proportional to a preselected machine phase angle relationship magnitude, said first circuit means providing a machine phase angle command signal in accordance with said preselected machine phase angle relationship magnitude during intervals of synchronous machine start-up and in accordance with the difference between said operator-commanded inverter-synchronous machine drive system parameter magnitude and the actual inverter-synchronous machine drive system parameter magnitude during intervals other than said synchronous machine start-up intervals;

second circuit means coupled to said inverter and said synchronous machine for supplying a machine phase angle signal proportional to the actual phase angle relationship magnitude between synchronous machine air gap flux and stator current in accordance with the conduction period of said solid state switching devices during intervals of light synchronous machine loads and in accordance with magnitude of synchronous machine current during intervals other than light synchronous machine loads; and

third circuit means coupled to said first and said second means and said inverter for controlling the solid state switching device conduction frequency in accordance with the magnitude difference between said first means machine phase angle command signal and said second means machine phase angle to achieve and maintain inverter-synchronous machine synchronism, particularly during said intervals of light synchronous machine loads.



8. In an inverter-synchronous machine drive system responsive to operator commands and including a synchronous machine, an inverter configured of a plurality of pairs of inverter solid state switching devices, the switching devices of each of said pairs of solid state switching devices coupled in series aiding fashion and each pair of solid state switches coupled across a unidirectional current source and coupled at the junction between series-coupled solid state switching devices to a respective machine phase, the solid state switching devices of said pairs of solid state switching devices being rendered conductive in a predetermined sequence to supply said synchronous machine with alternating current, and apparatus for controlling the conduction frequency of solid state switching devices in accordance with a feedback machine phase angle signal, which varies in accordance with synchronous machine terminal voltages and stator currents, the improvement comprising:

a substitute current generator circuit coupled to said inverter, said synchronous machine, and to said apparatus for controlling the conduction frequency of said inverter solid state switching devices, said substitute current generator including a plurality of differential amplifiers corresponding in number to the number of solid state switching

device pairs, each differential amplifier being coupled at a first input to said inverter for receiving therefrom a signal proportional in magnitude to the difference between conduction periods of the solid state switching devices of said respective one of said plurality of pairs of solid state switching devices, each said differential amplifier being coupled at a second input to ground and providing an output signal proportional to the difference magnitude between input signals supplied to said first and second differential amplifier inputs; and

analog switching means responsive to the magnitude of inverter link current for coupling each of said plurality of differential amplifiers to said apparatus during said intervals of light synchronous machine loads and for coupling said apparatus to said synchronous machine during intervals other than light synchronous machine load intervals.

4,258,303

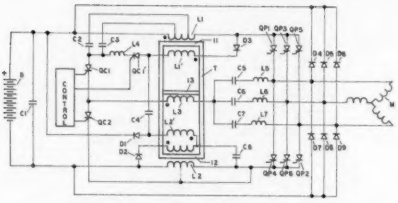
ENERGY CONTROLLER FOR CONVERSION FROM A DIRECT CURRENT SOURCE TO A VARIABLE FREQUENCY LOAD

Jay Boyce, Anaheim, Calif., assignor to Jay Boyce & Associates, Anaheim, Calif.

Continuation-in-part of Ser. No. 933,656, Aug. 14, 1978, Pat. No. 4,214,196. This application Sep. 10, 1979, Ser. No. 73,646

Int. Cl.³ H02P *7/42, 7/64*

U.S. Cl. 318—811 **9 Claims**



1. A turn off circuit for a multiphase motor comprising a DC powered, three element core transformer including:

i. a central core element having a winding thereon;

ii. outer core elements bearing loosely coupled positive and negative windings, thereby reducing rf transients, the central and outer windings being closely coupled, thereby enhancing pulse generation;

iii. a plurality of parallel connected capacitors coupled to an outer winding to fire simultaneously and thereby provide uniform and suitably shaped trapezoidal turn off pulses; and,

iv. positively and negatively biased turn off SCRs to sequentially fire and admit the turn off pulses to the central winding for switching DC power from the motor.

4,258,304

BATTERY CHARGER FOR ELECTRICAL VEHICLE

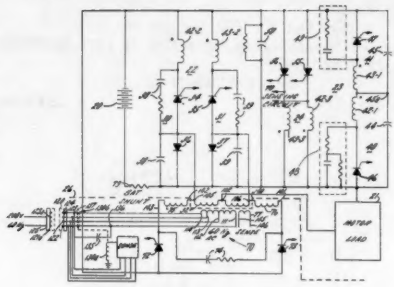
Robert F. Bourke, Kamiah, Id., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 19, 1978, Ser. No. 943,875

Int. Cl.³ H02J *7/10;* **B62D** *45/00*

U.S. Cl. 320—2 **9 Claims**

1. In an electric vehicle having a propulsion battery, a propulsion motor, a power converter for controlling power from the battery to the motor, the converter having a magnetic element with a first winding interposed between the output of the converter and the motor for delivering power from the battery through the converter to the motor, the improvement comprising, a primary winding on said magnetic element, means coupling AC power to the primary winding for charging the battery, controlled rectifier means connected between the first winding of the magnetic element and the battery, and gate means for triggering the controlled rectifier means for



rectifying the AC power and supplying said rectified power through said first winding to the battery for charging same.

4,258,305

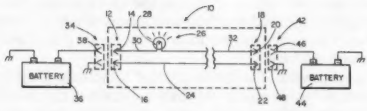
EMERGENCY BATTERY CHARGER DEVICE

Russell E. Anglin, 6157 Cottle Rd., San Jose, Calif. 95123

Filed Feb. 21, 1979, Ser. No. 13,265

Int. Cl.³ H02J *7/00*

U.S. Cl. 320—2 **5 Claims**



1. An emergency battery charger device comprising

first plug means engageable with the cigarette lighter socket of a first vehicle, said first plug means having a first negative contact and a first positive contact,

second plug means engageable with the cigarette lighter socket of a second vehicle, said second plug means having a second negative contact and a second positive contact, said first negative contact and said second negative contact defining a negative contact pair and said first positive contact and said second positive contact defining a positive contact pair,

coupling means coupling one of said negative contact pair and said positive contact pair together,

current limiter means including a light emitting device coupling the other one of said negative contact pair and said positive contact pair together, where said first plug means forms a portion of a housing for said light emitting device.

4,258,306

STATE OF BATTERY CHARGE INDICATOR CIRCUIT

Robert F. Bourke, Kamiah, Id., and David K. Johansen, Lake-in-the-Hills, Ill., assignors to Gould Inc., Rolling Meadows, Ill.

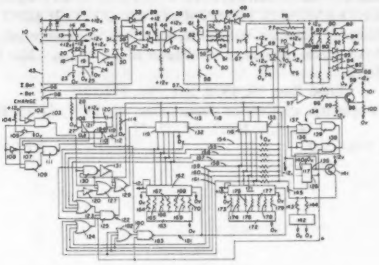
Filed Sep. 19, 1978, Ser. No. 943,629

Int. Cl.³ H02J *7/00*

U.S. Cl. 320—48 **23 Claims**

1. In a circuit for indicating the actual state of charge of a storage battery including means for providing a first signal proportional to battery current, means for producing a second signal proportional to the internal resistance of the battery at its actual state of charge, means for providing a third signal proportional to the actual terminal voltage of the battery, means for combining said signals to produce an output signal proportional to the actual state of charge, and converting means for converting the output signal to an indication of the

actual state of charge of the battery, the improvement comprising:



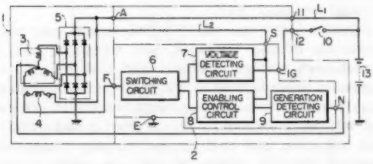
disabling means for preventing the converting means from indicating an increase in the state of charge during use of the battery as a power source.

4,258,307

VOLTAGE CONTROL APPARATUS FOR A VEHICLE-MOUNTED ALTERNATOR

Kazumasa Mori, Aichi; Taro Asahi, Chiryu; Keiichiro Banzai, Toyota; Katsutaro Iwaki, Chiryu; Katsuya Muto, Kariya; Akira Mase, Handa; Takayasu Nimura, Nagoya; Katsumi Itoh, Oobu, and Yoshio Akita, Ichinomiya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 3, 1979, Ser. No. 54,433
Claims priority, application Japan, Jul. 7, 1978, 53-83344
Int. Cl.³ H02J 7/14
U.S. Cl. 322—28 **3 Claims**



1. A voltage control apparatus for a vehicle-mounted alternator which includes an armature coil, an exciting coil and means for rectifying an a.c. output of said armature coil, comprising:

means connected to said exciting coil, for controlling the magnitude of a current flowing through said exciting coil, said current control means having an active region;

first means connected to said current control means and an engine key switch of a vehicle, responsive to closure of said key switch for controlling said current control means;

second means connected to said current control means and said exciting coil, for maintaining said current control means to be at a predetermined active state irrespective of said first means;

means connected to said alternator, for detecting the operating state of said alternator to produce a detection signal when said alternator has reached a predetermined operating state; and

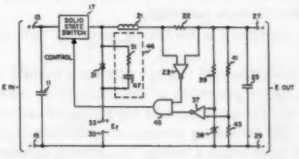
means connected between said detecting means and said second means, for disabling the operation of said second means in response to said detection signal.

4,258,308

SWITCHING REGULATOR WITH FLYBACK CONTROL OFFSET

Richard C. Weischedel, Camillus, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,508
Int. Cl.³ G05F 1/56
U.S. Cl. 323—285 **6 Claims**



1. A switching regulator for providing regulated power to a load, comprising:

(a) a power source which includes means for providing power input to the regulator at first and second voltage levels with the first of the two voltage levels being higher than the voltage of the regulated power output to the load and the voltage of the regulated power of the load being greater than the second of the two voltage levels;

(b) means including a switch for connecting the higher voltage output of said unregulated power source to said load, said switch being operable in response to a control input to open and close the connection therethrough between the source and load;

(c) choke means interposed in the connection between said switch and said load for smoothing the load power;

(d) means for sensing a load power condition and for applying in response thereto a control input to said switch for operating the switch to hold the sensed load power condition at a regulated value thereof; and

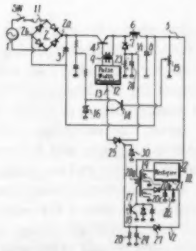
(e) means for supplying power to said load during periods when said switch is open comprising unidirectional current flow means connecting the lower voltage output of said unregulated power source to the point of connection of said switch and said choke means; whereby power is supplied to the load from the higher voltage output of said source through said switch when the switch is closed and is supplied from the lower voltage output of said source through said unidirectional current flow means when said switch is open.

4,258,309

SWITCHING TYPE POWER SUPPLY CIRCUIT

Yukio Ohsaka, and Takaharu Ikeda, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 5, 1979, Ser. No. 54,790
Claims priority, application Japan, Jul. 7, 1978, 53-83445
Int. Cl.³ G05F 1/58; H04N 3/18
U.S. Cl. 323—287 **2 Claims**



1. A switching type power supply circuit for supplying a voltage to an output circuit comprising:

a DC voltage source having a pair of output terminals;

a switching element having an ON and an OFF state and an inductance element connected in series between said pair of output terminals of said DC voltage source so as to form a first junction between said switching element and said inductance element and a second junction between said inductance element and said DC voltge source;

a source of reference potential;

a series connection of a fly-wheel diode and a current detecting resistor connected between said first junction and said source of reference potential;

means for supplying a switching pulse to said switching element;

means for detecting said voltage produced by said output in response to the operation of said inductance element and

control means for stopping said supplying of said switching pulse to said switching element so as to turn the latter to said OFF state when a voltage across said detecting resistor exceeds a predetermined level or when the detected voltage produced by said output circuit exceeds a predetermined level, said control means including a thyristor having an anode electrode connected to said means for supplying a switching pulse, a cathode electrode connected to said detecting resistor, and a gate electrode connected to said means for detecting said voltage produced by said output circuit.

4,258,310

SELECTIVELY ADJUSTABLE VOLTAGE DETECTION INTEGRATED CIRCUIT

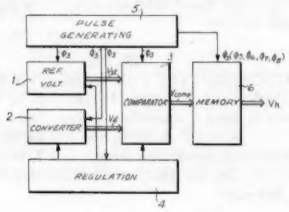
Tatsushi Asakawa, and Shinji Morozumi, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 26, 1978, Ser. No. 900,214

Claims priority, application Japan, Apr. 26, 1977, 52/48290; Apr. 26, 1977, 52/48291

Int. Cl.³ G04C *10/04*

U.S. Cl. 323—281 **35 Claims**



1. A voltage detection circuit for use with a voltage source adapted to deliver a source voltage comprising in combination reference voltage means for producing a set reference voltage, voltage converter means for producing a converted voltage representative of the source voltage delivered by said voltage source, comparator means for receiving said set reference voltage and said converted voltage, and for providing a comparison signal in response thereto, and regulation circuit means intermediate one of said reference voltage means and converter means and comparator means for selectively varying one of said set voltage and converted voltage to be applied to said comparator means each of said regulation circuit means, reference voltage means, voltage converter means and comparator means being comprised of integrated circuit elements that are fabricated into the same circuit chip.

4,258,311

CONSTANT VOLTAGE GENERATOR FOR GENERATING A CONSTANT VOLTAGE HAVING A PREDETERMINED TEMPERATURE COEFFICIENT

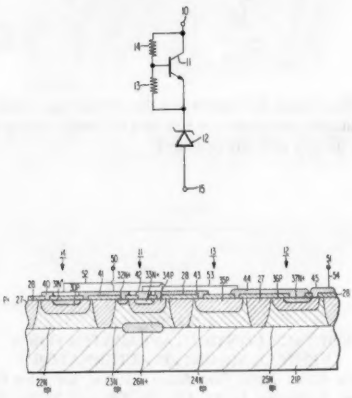
Kazuo Tokuda; Hidetaro Watanabe, and Yoshikazu Shimizu, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 971,136

Claims priority, application Japan, Dec. 19, 1977, 52-153184

Int. Cl.³ H01L *27/04, 29/90*

U.S. Cl. 323—313 **5 Claims**



1. A constant voltage generator comprising:

at least one transistor having a base, an emitter and a collector,

a Zener breakdown voltage generator having at least one Zener diode and connected in series to a collector-emitter path of said transistor,

a first resistor connected between said emitter and said base of said transistor, and

a second resistor connected between said base and said collector of said transistor, said transistor, said Zener breakdown voltage generator and said first and second resistors being formed in a common semiconductor substrate, said first resistor composed of a first resistive region of only one conductivity type formed in said semiconductor substrate, and said second resistor composed of a second resistive region of said one conductivity type formed in said semiconductor substrate with at least a part of said second resistive region being covered with a region of the other conductivity type.

4,258,312

VITAL VOLTAGE REGULATOR AND PHASE SHIFT CIRCUIT ARRANGEMENT

Heinz Gilcher, Export, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Apr. 20, 1979, Ser. No. 31,885

Int. Cl.³ G05F *3/06*

U.S. Cl. 323—306 **4 Claims**

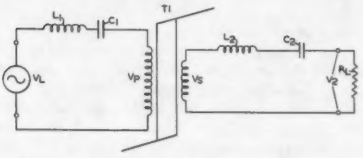
1. Vital voltage regulator and phase shift apparatus, for supplying, to a load network, a controlled voltage output signal from an energy source having a selected frequency, comprising,

(a) a saturable transformer with a primary and a secondary winding and having a saturation limit below the normal voltage level of said source for regulating the voltage of said output signal within predetermined limits over the operating range of said source,

(b) an output filter network coupling said transformer sec-

ondary winding to said load network and tuned to said selected frequency for blocking harmonic frequency signals produced by the saturation limiting action of said transformer, and

(c) an input filter network coupling said transformer primary winding to said source and tuned to cooperate with the equivalent input inductance of the unsaturated transformer for resonating below said selected frequency for holding the output signal in phase with the input signal,



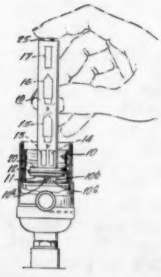
(d) said input filter network further responsive to the change in equivalent input inductance of the saturated transformer for shifting the phase of the output signal with respect to the input signal from said source by a predetermined angle.

4,258,313

SOCKET TEST DEVICE FOR TESTING THREE WAY LAMP SOCKETS

Welford T. Cheatham, Jr., 1216 N. Alden St., Philadelphia, Pa. 19131, and Franklin P. Ryan, Sr., 503 W. Carpenter La., Philadelphia, Pa. 19119

Filed Oct. 4, 1978, Ser. No. 948,496
Int. Cl.³ G01R *31/02, 19/155*
U.S. Cl. 324—51 **6 Claims**



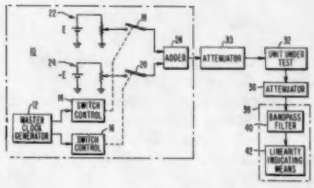
1. A socket test device for testing a socket having at least two hot line contacts and a ground comprising an elongated handle portion, a base at one end of the handle portion of a greater cross section than said handle, an annular ground ring on the periphery of said base adapted to contact the socket ground, a first hot line contact projecting from the bottom face of said base centrally thereof adapted to engage one of said socket contacts, a second annular hot line contact circumscribing said first contact adapted to engage the other socket contact, at least two light indicator means in the form of bulbs each connected in series with a current limiting device to said first and second hot line contacts respectively, one of said bulbs being energized when a closed circuit path is established between the one of said socket contacts and the socket ground via said first contact, current limiting device and annular ground ring, said second bulb being energized when a closed circuit path is established between the other of said socket contacts and the socket ground via said second contact, current limiting device and annular ground ring.

4,258,314

NONLINEAR DISTORTION MEASUREMENT USING COMPOSITE PULSE WAVEFORM

Yoshimutsu Hirata, 2568-9, Ishikawa-cho, Hachioji, Tokyo, Japan

Filed Apr. 30, 1979, Ser. No. 34,438
Claims priority, application Japan, Mar. 30, 1979, 54-37067
Int. Cl.³ G01R *27/00*
U.S. Cl. 324—57 R **28 Claims**



1. An apparatus for measuring the linearity of a circuit, comprising:

means for generating a test signal waveform having a first value for a first predetermined time period, a second value for a second predetermined time period immediately following said first predetermined time period and a third value for a third predetermined time period immediately following said second predetermined time period, said first and third values being equal in magnitude and polarity to each other, said second value being different in magnitude and polarity from said first and third values, the area of the part of said test signal waveform above the zero axis being equal to the area below the zero axis;

means for applying said test signal waveform to said circuit, said circuit tending to alter the applied waveform in accordance with the linearity and gain of said circuit to produce as an output signal an altered test signal waveform; and

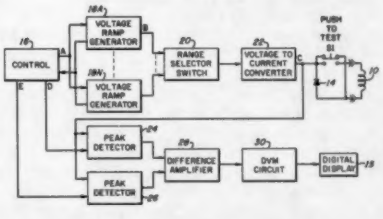
means for determining the level of a predetermined low frequency component of said altered test signal waveform and for comparing the determined level to its theoretical level to produce an output signal indicative of the linearity of said circuit, said theoretical level being equal to the level of said predetermined low frequency component of said unaltered test signal waveform multiplied by the gain of said circuit.

4,258,315

INDUCTANCE METER

Marlin D. Westra, Sioux Falls, S. Dak., assignor to Sencore, Inc., Sioux Falls, S. Dak.

Filed Dec. 21, 1978, Ser. No. 971,880
Int. Cl.³ G01R *11/52, 27/26*
U.S. Cl. 324—59 **6 Claims**



5. A method of measuring the inductance of a coil, comprising the steps of

passing through said coil during a first period of time a linearly changing current,

measuring and storing the peak voltage developed across said coil during said first period,

passing through said coil during a second period of time a steady state current having an amplitude equal to the peak current passed through said coil during said first period,

measuring and storing the peak voltage developed across said coil during said second period, and

applying a voltage equal to the difference between said peak voltages to a voltmeter,

whereby the readout of said voltmeter is directly related to the inductance of said coil.

4,258,316

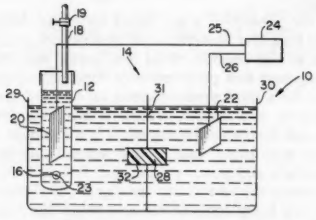
USE OF FLUID RETARDING ION CONDUCTING MATERIAL

Robert C. Leif, Coral Gables, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Dec. 8, 1978, Ser. No. 967,773

Int. Cl.[3] G01N *27/00*

U.S. Cl. 324—71 CP **18 Claims**



1. A particle sensing transducer apparatus for detecting the physical properties of particles suspended in an electrolyte solution, wherein said transducer apparatus includes first chamber means containing a first electrode disposed in a quantity of the electrolyte solution, second chamber means containing a second electrode disposed in a quantity of the electrolyte solution, orifice means for establishing a constricted electrical path between the electrodes by providing a passageway between the chamber means for a sample flow of the electrolyte solution having the particles suspended therein, wherein the improvement comprises:

filter means interposed in fluid retarding, ion conducting relationship between the orifice and at least one of the electrodes for providing an ionic current flow but retarding a fluid flow from the electrode,

whereby said filter means substantially isolates the sample flow from at least one of the electrodes.

4,258,317

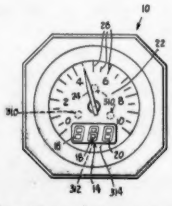
COMBINATION ANALOG-DIGITAL INDICATOR

Thomas A. Dubauskas, Waterbury, Conn., assignor to The Lewis Engineering Company, Naugatuck, Conn.

Filed Apr. 12, 1979, Ser. No. 29,569

Int. Cl.[3] G01R *1/00, 1/08*

U.S. Cl. 324—114 **14 Claims**



1. An electrical indicator device for providing continuous and simultaneous analog and digital readings of a particular, single electrical parameter which is to be continuously monitored, comprising in combination:

(a) a d'Arsonval meter movement,

(b) a meter scale plate having a useful indicating area provided with calibrating indicia,

(c) a pointer carried by said d'Arsonval movement and movable over said useful indicating area,

(d) said indicator device having an input circuit adapted to be connected to the source of the parameter being monitored,

(e) a liquid crystal digital display, and

(f) a digital voltmeter having its input connected to the input circuit of the device, and having an output connected to drive the liquid crystal display,

(g) said display comprising multiple digits, each digit having a backplane and multiple segments which are selectively energized to produce numerical designations,

(h) said segments being disposed closely adjacent said useful indicating area but lying completely outside of the same, and being disposed outside of the useful range of movement of the pointer so as to be not interfered with by the latter whereby all of said segments are always completely visible in a single glance from the front of the indicator device simultaneously with the viewing of said useful indicating area and regardless of the position of the pointer on said area,

(i) said meter scale plate being substantially circular and having a central opening providing clearance for the pointer support,

(j) said multiple segments of the digital voltmeter being located below the central opening of the scale plate,

(k) said d'Arsonval movement and liquid crystal display being permanently connected to continuously measure the single, same electrical parameter being monitored,

(l) means for electrically illuminating the pointer along its length, and

(m) a light mask for shielding light from said means forwardly of the pointer.

4,258,318

FLAW DETECTOR FOR PIPE EMPLOYING MAGNETS LOCATED OUTSIDE THE PIPE AND DETECTOR MOUNTED INSIDE AND MOVABLE ALONG THE PIPE WITH THE MAGNETS

Yasuyuki Furukawa; Yoshihisa Fujii; Hitoshi Tanaka, all of Wakayama, and Tetsuya Hirota, Amagasaki, all of Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

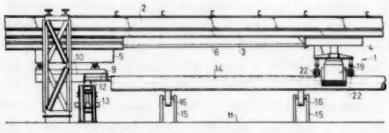
Continuation of Ser. No. 809,829, Jun. 24, 1977, abandoned.

This application Dec. 13, 1978, Ser. No. 969,125

The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.

Int. Cl.[3] G01R *33/12;* G01N *27/82*

U.S. Cl. 324—220 **2 Claims**



1. A magnetic inspection apparatus for the inner surface of a pipe comprising:

a wheeled carriage adapted to travel along a rail;

a supporting rod having a tip portion and secured to the wheeled carriage and adapted to have its tip portion inserted into a pipe to be inspected, said supporting rod being hollow at least in the tip portion thereof and being formed in the tip portion with a window which faces the inner surface of said pipe;

a detecting mechanism portion including; a mount housed in

the tip portion of said supporting rod and movable radially thereof; at least two detecting portions placed on said mount in parallel to the axis of said supporting rod and having magnetic-sensitive elements which face the inner surface of said pipe to be inspected through said window in said supporting rod; inclined surfaces provided on the under-surface of said mount which support thereon said detecting portions and extending axially of said supporting rod, said inclined surfaces being adapted to engage rollers movable axially of said supporting rod; and two or more guide rollers mounted on said mount in parallel to each other and adapted to roll on the inner surface of said pipe to be inspected, to thereby support said mount, when said magnetic-sensitive elements are brought closer to the inner surface of said pipe to be inspected;

a guide mechanism portion including; a supporting frame secured to the tip portion of said supporting rod and adapted to expand in a direction opposite to the direction in which said magnetic-sensitive elements project; and guide rollers attached to said supporting frame and rolling on the inner surface of said pipe, thereby supporting said supporting rod when said supporting frame in expanded;

an exciting mechanism portion including; a DC exciting head mounted on the wheeled carriage and adapted to be brought close to the outer surface of said pipe to be inspected and to be moved away therefrom, together with said wheeled carriage, said exciting head including exciting magnets placed in opposed relation to said magnetic-sensitive elements through the medium of the wall of the pipe, and follower rollers suspending said exciting magnets and rolling on the outer surface of said pipe to be inspected, thereby supporting said exciting magnets in the vicinity of the outer surface of said pipe, respectively; and

means for rotating the pipe to be inspected about the central axis thereof.

4,258,319

SURFACE DEFECT DETECTING APPARATUS FOR USE WITH ROTATING CIRCULARLY SHAPED METALLIC MATERIAL

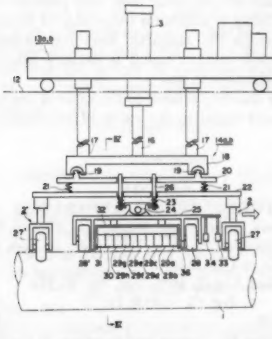
Katsuhiko Shimada, Yokohama; Isamu Komine, Yokosuka; Hideya Tanabe, Yokohama; Shuichi Tsunozaki, Yokohama; Masayoshi Yamada, Yokohama, and Tsuguo Takahashi, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1978, Ser. No. 940,155

Claims priority, application Japan, Sep. 8, 1977, 52-107197

Int. Cl.[3] **G01N** *27/72;* **G01R** *33/00;* **G01N** *27/82;* **G01R** *33/12*

U.S. Cl. 324—226 **1 Claim**



1. A surface defect detecting apparatus for cylindrical metal pieces which rotate at a predetermined peripheral speed and move in a lengthwise direction relative to a sensor block comprising, a plurality of eddy-current flaw detecting coils facing the test piece, said sensor block being rotatable about a horizontal axis extending vertically with respect to the axis of said test piece to follow up deflections of said test piece in the direction of the axis of rotation; said sensor block is provided at its front and rear end, viewed in longitudinal direction of said test piece, with a pair of guide wheel means being pressable from above onto said piece to be inspected, said sensor block further comprising color marking means for automatically marking defect areas in response to detector signals depending on the depth of the defect, wherein: relative movement in the longitudinal direction of the test piece is carried out by means of a carriage to which the sensor block is secured, said guide wheels of each pair of guide wheel means are arranged in a plane transverse with respect to the longitudinal direction of the test piece, at a predetermined distance from each other; a base member is suspended from said carriage supported by a supporting girder means, onto which base member pressure is exerted by a presser and to which a slide plate is mounted, said slide plate is slidable in a horizontal direction, vertically with respect to the direction of travel of said carriage, a follow-up plate being resiliently suspended from said slide plate, a sensor holder being suspended from said follow-up plate by means of a resilient means and a hinge for rotation about the horizontal axis, to front and rear parts of which follow-up plate guide wheels are mounted, said sensor holder being adapted to support said eddy current flaw detecting coils, whereby both ends thereof have turning wheels associated therewith; first end positioning table means whereby said material, upon entering, is moved in an axial direction to locate one end of said material in a predetermined position, second table means including a plurality of turning rollers to rotate at the predetermined peripheral speed said material which has been subjected to said end positioning, said carriage being movably mounted on said supporting girder means to permit movement of said carriage while so disposed such that said sensor block suspended from said carriage is positioned just above said second table means, and extractor means movable at right angles to said first and second table means for moving said material to said first table means, moving said material from said first table means to said second table means and further removing said material from said second table means; said eddy current flaw detecting coils are arranged in a line in the longitudinal direction of the test piece in a single sensor holder included within said sensor block at respective front and rear ends of said sensor holder in a longitudinal direction of the test piece, the speed of the travel of the carriage is determined in accordance with the distance between said eddy current flaw detecting coils in said feedback circuit which is dependent on the width of said eddy-current flaw detecting coils, a predetermined set peripheral speed value and the outer diameter of said material, so as to detect the defects of said material; said turning wheel means are each positioned between said guide wheels arranged in the direction of spiral scanning, and in rotatable contact with the outer surface of said test piece, the impedances of the coils are differently selected such that the characteristics of feedback amplifiers form a feedback circuit each with two of said coils are fed by a generator, and are linear for eddy-current signals corresponding to different flaw depth ranges; a phase detector circuit to provide signals in response to different flaw depth range are amplified within the linear characteristic range and are supplied to nozzles of the color marking means, said nozzles each being associated with a flaw depth range, being adapted to spray different colors and said sensor block further comprises an eddy-current distance detecting coil for measuring the gap between said eddy-current flaw detecting coils and the outer surface of said material, and wherein there is further provided automatic gain control means whereby a flaw signal detected by each of said eddy-current flaw detecting coils is subjected to automatic gain control in response to a gap distance signal detected by said distance detecting coil.

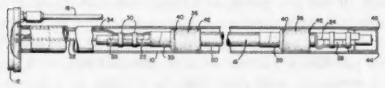
4,258,320
APPARATUS AND METHOD EMPLOYING FOAM SLEEVES FOR SUPPORTING MAGNETIC SENSORS IN A TUBULAR HOUSING

Erick O. Schonstedt, Reston, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Continuation-in-part of Ser. No. 757,124, Jan. 5, 1977, Pat. No. 4,110,689, which is a continuation of Ser. No. 542,084, Jan. 17, 1975, abandoned, which is a division of Ser. No. 303,598, Nov. 3, 1972, Pat. No. 3,894,283. This application Aug. 7, 1978, Ser. No. 931,937

Int. Cl.[3] **G01R** *33/00;* **H02G** *3/00*

U.S. Cl. 324—262 **12 Claims**



1. Apparatus for supporting magnetic sensors in a tubular housing, comprising an elongated support adapted to have magnetic sensors mounted thereon, a resiliently compressible sleeve through which said support extends, and attachment means securing the sleeve to the support at a leading end portion of the sleeve, the sleeve being tapered so that it is narrower at the leading end portion than at a trailing portion, whereby the elongated support may be inserted in the tubular housing axially, with the leading end portion of the sleeve entering the housing before the trailing portion, and the sleeve may engage the inner surface of the housing to shock mount the support in the housing and to resist movement of the support in the housing in a direction opposite to the insertion direction.

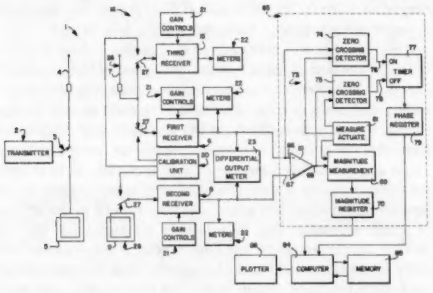
4,258,321
RADIO GEOPHYSICAL SURVEYING METHOD AND APPARATUS

Dory J. Neale, Jr., 4605 E. Kentucky, Denver, Colo. 80222

Continuation-in-part of Ser. No. 884,825, Mar. 9, 1978, abandoned. This application Jul. 5, 1978, Ser. No. 922,104

Int. Cl.[3] **G01V** *3/17*

U.S. Cl. 324—334 **19 Claims**



10. In an apparatus for radio geophysical surveying including a transmitter, transmitting antenna means, a first receiver connected to a first receiving antenna responsive to vertically polarized signal components only, and a second receiver connected to a second receiving antenna responsive to both vertically and horizontally polarized signal components, each of said transmitter, transmitting antenna means, receivers, and receiving antennas being tuned to a predetermined frequency, said receivers having respective output signals in response to operation of said transmitter, said apparatus for determining the relative magnitude and phase of horizontally polarized signal components radiated from said transmitting antenna means, propagated into the earth, reflected to the surface by subterranean formations and received by said second receiver through said second receiving antenna, said relative magnitude and phase being determined for each of a plurality of positions along a survey path, the improvement comprising:

(a) a difference amplifier having one input connected to the output of said first receiver and another input connected to the output of said second receiver, said difference amplifier having a difference output signal proportional to the vectorial difference of said receiver output signals;

(b) means for measuring the magnitude of said difference signal connected to the output of said difference amplifier; and

(c) phase measuring means connected to the output of said difference amplifier and to the output of said first receiver for measuring the phase of said difference signal relative to the phase of the output signal of said first receiver.

4,258,322
ELECTROMAGNETIC SUBSOIL PROSPECTING PROCESS USING AN ASYMPTOTIC LOW FREQUENCY RANGE

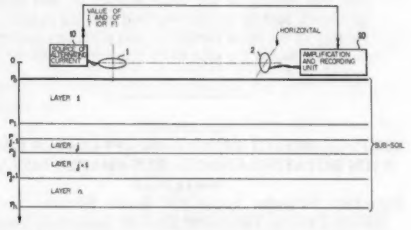
Jean-Pierre Rocroi, Massy, and Andre Cecchini, Chatenay-Malabry, both of France, assignors to Compagnie Generale de Geophysique, Massy, France

Filed May 8, 1978, Ser. No. 903,800

Claims priority, application France, May 9, 1977, 77 14085

Int. Cl.[3] **G01V** *3/10*

U.S. Cl. 324—335 **32 Claims**



1. A sub-soil prospecting method, comprising the steps of:

(a) placing above ground a magnetic transmitter dipole and a magnetic receiver dipole spaced at a distance from each other in a prospecting area;

(b) energizing the transmitter dipole with alternating current of frequency below a predetermined low frequency;

(c) sensing at an output of the receiver dipole a signal representing a detected magnetic field, said predetermined low frequency being a maximum frequency of an asymptotic range in which the magnetic field represented by the receiver dipole output signal is linearly related to the energizing frequency; and

determining a quantity related to the ratio of the magnitude of said sensed signal to the value of said energizing frequency.

4,258,323
CATHODIC SURVEY APPARATUS

Larry A. Andrews, Tonganoxie, Kans., and Thomas N. Tietze, Kansas City, Mo., assignors to Panhandle Eastern Pipe Line Company, Kansas City, Mo.

Filed Aug. 2, 1979, Ser. No. 63,118

Int. Cl.[3] **G01R** *11/30*

U.S. Cl. 324—348 **15 Claims**

11. An apparatus for sensing and locating an electrical current leakage fault path in a cathodically protected pipeline buried in the ground and comprising:

(a) a conductor wire having a first end electrically connected to a pipeline for sensing electrical current therein;

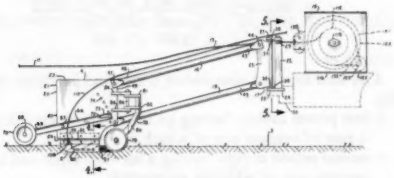
(b) a reel for winding and unwinding said conductor wire

and having support members for mounting said reel on a vehicle;

(c) distance measuring means and level winding means for said conductor wire connected to said reel and movable thereacross;

(d) a drafting structure for towing behind the vehicle and having a hitch portion electrically insulated from the vehicle, a body member, upper and lower draw arms of substantially equal length extending between said hitch portion and said body member and forming a parallelogram shaped structure for keeping said body member at a constant attitude relative to the ground, and a height regulating mechanism for said body member including an elongate arm swingably connected to said body member for vertical swinging movement and having a rear end extending rearwardly of said body member, a fastener selectively securing said elongate arm to said body member for projection of said elongate arm at a selected angle therefrom, and a ground engaging wheel rotatably connected to said elongate arm rear end and maintaining said body member at a selected height above the ground;

(e) an earth cutting blade adapted for plowing through said blade being secured to said body member and adjustable in



height and depth therewith for travel below a ground surface a sufficient depth to encounter an electrical leakage fault path;

(f) an electrode positioned in a passage in said blade and having a conductive metal member and a plurality of porous plugs extending generally transversely through said blade and physically contacting said metal member, said electrode having an electrically conductive liquid wetting said plugs and providing a path of low resistivity from the ground to said metal member for sensing the electrical current leakage fault path;

(g) a coulter assembly mounted to said body member and having a disc positioned forwardly of said blade for slicing through vegetation and deflecting articles from a path of travel of said blade; and

(h) monitoring means electrically interposed between said electrode and said conductor wire and operable to collect, store, process and analyze data derived from said electrode with reference to an electrical current in said pipeline transmitted by said conductor wire for continuously determining the extent of cathodic protection of said pipeline and locating electrical current leakage fault paths therealong.

4,258,324

SIGNAL CONDITIONING CIRCUIT FOR MAGNETIC SENSING MEANS

Robert S. Henrich, Farmington Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.

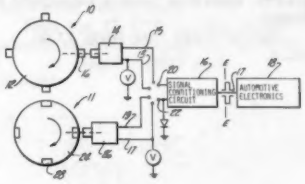
Division of Ser. No. 828,806, Aug. 29, 1977, Pat. No. 4,169,232. This application Feb. 9, 1979, Ser. No. 10,572

Int. Cl.³ F02P *17/00*

U.S. Cl. 324—392 **9 Claims**

1. A signal conditioner circuit for discriminating between a noise component and a signal component of an output signal from a magnetic sensor having a rotational member while simultaneously indicating a zero crossing between a positive peak and a negative peak of the output signal, where both of said components of the output signal increase proportionately to the velocity of the rotational member, said conditioner circuit comprising:

comparator circuit means receiving as an input said output signal from the magnetic sensor for comparing said signal component with a threshold greater than said noise component subsequent to said zero crossing and for generating in response to said comparison a first voltage level having



an edge transition from a second voltage level which transition occurs substantially at said zero crossing and is indicative thereof; and

circuit means, responsive to a variable which changes proportionally to the velocity of the rotational member, for maintaining said threshold greater than said noise component in order to discriminate between said increasing noise component and said increasing signal component.

4,258,325

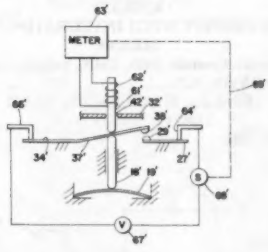
THERMOSTAT AND METHOD OF TESTING THEREOF

Steven R. Richardson, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed May 21, 1979, Ser. No. 40,996

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—417 **11 Claims**



1. A thermostat comprising a housing assembly, a switch enclosed within said housing assembly, a bimetal snap disc in said housing assembly, and operating means connected between said disc and switch operating said switch in response to movement of said disc while said disc is in snap movement, said housing assembly completely enclosing said switch excepting for a gaging opening sufficient to allow testing of the gaging of said thermostat after said thermostat is fully assembled, and closure means closing and gaging opening after said testing, said gaging opening being located to allow a probe to be inserted into said housing assembly in alignment with said operating means to engage a portion of said thermostat which is moved by said snap disc while said thermostat is being thermally cycled.

4,258,326
CAPACITIVE DETECTION OF ABSENT AND/OR DOUBLE SHEETS IN THE SHEET TRANSPORT PATH OF A PRINTING MACHINE

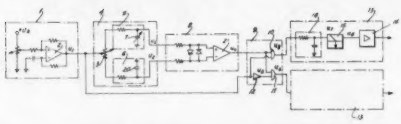
Albrecht Johne, Dresden, German Democratic Rep., assignor to VEB Polygraph Leipzig, Kombinat für polygraphische Maschinen und Ausrustungen, Leipzig, German Democratic Rep.

Filed Apr. 4, 1979, Ser. No. 26,827

Claims priority, application German Democratic Rep., Apr. 17, 1978, 204812

Int. Cl.³ H04B 7/14; H03K 17/90

U.S. Cl. 328—5 **12 Claims**



1. In a detecting system of the type operative for detecting absent and/or multiple sheets in the sheet transport path of a printing machine and including a first RC circuit stage and a second RC circuit stage, a combination comprising a detecting capacitive structure forming the capacitance of the first RC circuit stage and operative for capacitively sensing normal, absent and multiple sheets; a reference capacitive structure forming the capacitance of the second RC circuit stage; means for applying an electrical signal to said detecting capacitive structure and to said reference capacitive structure, said applying means including means operative for applying a voltage pulse to the inputs of the first RC circuit stage and the second RC circuit stage; and comparator circuit means connected to said detecting capacitive structure and said reference capacitive structure, said comparator circuit means including means operative for comparing the response with respect to time exhibited by both RC circuit stages in response to application of said pulse and also the response with respect to time exhibited by the first RC circuit stage and the second RC circuit stage subsequent to termination of the pulse whereby a signal is generated, which signal indicates whether a normal or an absent or multiple sheet is being detected.

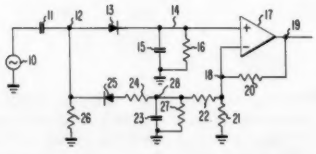
4,258,327
DETECTOR CIRCUIT WITH INTEGRATING FEEDBACK MEANS

Kay K. Fujimoto, Granada Hills, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 5, 1979, Ser. No. 54,927

Int. Cl.³ H03D 1/18

U.S. Cl. 329—101 **10 Claims**



6. An envelope detecting circuit comprising:

a first capacitor having a first plate connected to a source of time varying signal and having a second plate, connected to a first node;

a detecting pn junction having a first end connected at the first node and having a second end connected to a second node for supplying output singal responsive to the envelope defined by signal peaks of a particular polarity at said first node;

a second capacitor connected between the second node and a point of fixed potential;

means for integrating at least a portion of the potential at the second node and providing an integrated potential; and

means for applying a portion of said integrated potential to the first node.

4,258,328
FEED FORWARD MICROWAVE AMPLIFIER FOR COMMUNICATION SYSTEMS

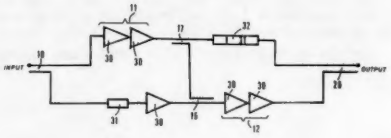
Julien Prevot, and Jean-Claude Raux, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Honorine, France

Filed Mar. 1, 1979, Ser. No. 16,381

Claims priority, application France, Mar. 3, 1978, 78 06093

Int. Cl.³ H03F 1/32, 3/68

U.S. Cl. 330—149 **3 Claims**



1. A feed forward microwave wide band amplifier comprising:

a first power divider having an information signal input and a pair of outputs one of which is attenuated;

a second power divider having a forward input and a pair of outputs one of which is attenuated;

a first amplifier connected between the unattenuated output of said first divider and the input of said second divider;

a third power divider having a pair of inputs and an output;

a first delay circuit having its input connected to the attenuated output of said first power divider;

a second amplifier connected between the output of said first delay circuit and one of the inputs of said third power divider;

means connecting the attenuated output of said second power divider to the other input of said third power divider;

an output power divider having a pair of inputs and an amplified output;

a second delay circuit connected between other output of said second power divider and one of the inputs of said output power divider; and

a third amplifier connected between the output of said third power divider and the other input of said output power divider; said second amplifier being a one amplification module and the delay of said first delay circuit being equal to the delay of the information signal introduced by said second amplifier, said first and third amplifiers each comprising two serially connected amplification modules, each identical to said first module.

4,258,329
NOISE SUPPRESSION SYSTEM

Akio Tokumo, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 21, 1979, Ser. No. 22,388

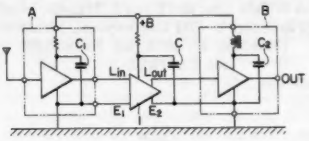
Claims priority, application Japan, Mar. 22, 1978, 53-36630[U]

Int. Cl.³ H03F 1/26

U.S. Cl. 330—149 **7 Claims**

1. A noise suppression device for automobile audio equipment comprising, a differential amplifier coupled between an audio source and an amplifier for amplifing a signal derived from said audio source, said audio source and said amplifier each grounded to the automobile by grounded terminals, said

differential amplifier having a first input terminal coupled to a grounded terminal of said audio source, a second input terminal coupled to an output terminal of said audio source and a



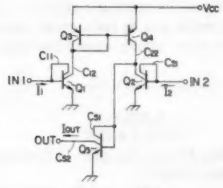
common terminal common to said amplifier, to apply the signal introduced between an output terminal and the common terminal of said differential amplifier to said amplifier.

4,258,330

DIFFERENTIAL CURRENT AMPLIFIER

Kenji Kaneko, Hachioji; Takahiro Okabe, Hinodemachi; Tohru Nakamura, Houya; Wasao Takasugi, Higashiyamato, and Minoru Nagata, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 14, 1979, Ser. No. 12,028
Claims priority, application Japan, Feb. 15, 1978, 53-17158[U]
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—257 **15 Claims**



1. A differential current amplifier comprising:

a first inverse NPN transistor which has first and second collectors, whose first collector is electrically connected to a base thereof and whose emitter is electrically grounded,

a second inverse NPN transistor which has first and second collectors, whose first collector is electrically connected to a base thereof and whose emitter is electrically grounded,

a third inverse NPN transistor which has first and second collectors, whose first collector is electrically connected to a base thereof and whose emitter is electrically grounded,

a first input terminal which is the base terminal of said first inverse NPN transistor,

a second input terminal which is the base terminal of said second inverse NPN transistor,

an output terminal which is the second collector terminal of said third inverse NPN transistor, and

a constant current circuit which is electrically connected to said second collector of said first inverse NPN transistor, said second collector of said second inverse NPN transistor and said base of said third inverse NPN transistor,

a differentially amplified output current of input currents at said first and second input terminals being provided from said second collector of said third inverse NPN transistor as forms said output terminals, and wherein said constant current circuit comprises:

a first PNP transistor whose collector is electrically connected to said second collector of said first inverse NPN transistor and whose emitter is electrically connected to a power supply, and

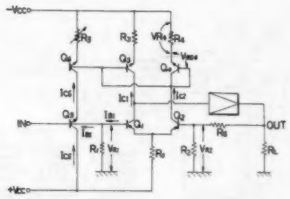
a second PNP transistor whose collector is electrically connected to said second collector of said second inverse NPN transistor and a base of said third inverse NPN transistor, whose base is electrically connected to said base of said first PNP transistor and whose emitter is electrically connected to said power supply.

4,258,331

DIFFERENTIAL AMPLIFIER

Kazuaki Nakayama, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 17, 1979, Ser. No. 30,793
Claims priority, application Japan, Apr. 18, 1978, 53/45638
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—261 **3 Claims**



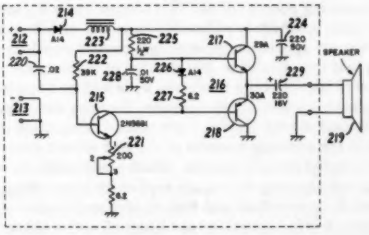
1. In a differential amplifier comprising a pair of first and second transistors of the same polarity wherein a base of said first transistor is connected to a base of a compensation transistor whose polarity is opposite to the polarity of said first transistor, the improvement comprising a current mirror circuit coupled to said differential amplifier and a load circuit connected in series to said compensation transistor, said load circuit implementing current mirror operation together with said current mirror circuit, whereby a base current of said first transistor is completely absorbed by said compensation transistor.

4,258,332

LOUDSPEAKER AMPLIFIER

Henry W. West, Red Bank, N.J., assignor to Wheelock Signals, Inc., Long Branch, N.J.

Division of Ser. No. 732,667, Oct. 15, 1976, abandoned. This application Mar. 29, 1979, Ser. No. 24,999
Int. Cl.³ H03F *3/04*
U.S. Cl. 330—297 **4 Claims**



1. In a loudspeaker amplifier having a signal input for an AC modulation signal which is amplified to produce an output signal driving a speaker, said amplifier having a power input for receiving DC power to operate said amplifier, the improvement comprising:

means for receiving a mixed AC modulation and DC power signal;

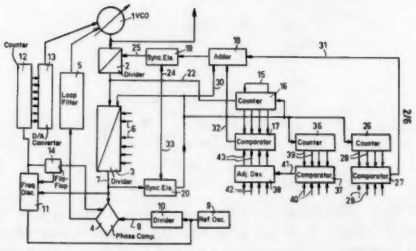
means for separating the AC modulation and the DC power from each other; and

means for applying the separated AC modulation to said amplifier signal input and the separated DC power to said amplifier power input.

4,258,333
FREQUENCY SYNTHESIZER HAVING A LOOP FILTER WITH A HIGH CUT-OFF FREQUENCY

Pierre Demuliere, Verrieres Le Buisson, and Pierre Heins, Bois d'Arcy, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,728
Claims priority, application France, May 17, 1978, 78 14547
Int. Cl.[3] H03L 7/08
U.S. Cl. 331—11 10 Claims

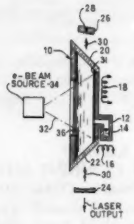


1. A frequency synthesizer comprising a phase-locked loop having, in this order, at least a voltage-controlled oscillator (VCO), a first divider with an adjustable division factor n or n+1, n being an integer, a second divider the division factor of which is a programmable integer M, a phase comparator and a low-pass filter, the output signal of this second divider and a reference signal having a frequency F being applied to said phase comparator for generating an output signal which is applied as control voltage to the voltage-controlled oscillator via the low-pass filter, the frequency synthesizer further comprising a first digital loop having a first pulse counter, for counting the input pulses of the said second divider and being restarted from its initial counting position by each output pulse of the second divider, and a first comparison device to which the counting position of said first counter and a digital numerical value u, which is adjustable by means of a first adjusting device, are applied for generating a control signal for controlling said first divider so that the size of the frequency steps is equal to the reference frequency F, as well as a second digital loop having a second pulse counter, counting the output pulses of the said second divider, and a second comparison device to which the counting position of the said second pulse counter and a digital numerical value, which is adjustable by means of a second adjusting device, are applied for generating a control signal for controlling said first divider so that the size of the frequency steps is equal to z, z being of such a value that F is a multiple thereof to obtain a division into decimal steps, characterized in that the frequency synthesizer further comprises a third digital loop for generating frequency steps having a size equal to y, y being of such a value that F is a multiple thereof, this third digital loop comprising a third pulse counter (modulo-F/y) for counting the output pulses of said second divider, and a third comparison device which compares the counting position a of the said third counter with a digital numerical value r, which is adjustable by means of a third adjusting device, for generating an output signal which increases the numerical value u in said first adjusting device by one unit for each time the position a is smaller than or equal to the numerical value r.

4,258,334
NOBLE GAS-HALOGEN TRANSFER LASER METHOD AND MEANS

Michael V. McCusker, Los Altos; Donald C. Lorents; Robert M. Hill, both of Palo Alto, and Davis L. Huestis, Menlo Park, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed May 17, 1976, Ser. No. 686,698
Int. Cl.[3] H01S 3/223
U.S. Cl. 331—94.5 G 21 Claims



1. A laser capable of producing stimulated laser emission comprising,

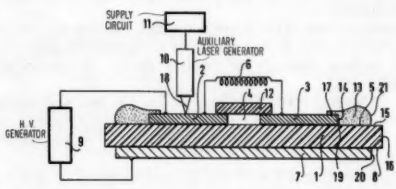
an optical resonant cavity containing a gas mixture comprising noble gas atoms and diatomic halogen gas molecules,

exciting means including an electron beam source for electronic excitation of the noble gas atoms to excite the same which excited noble gas, in turn, excite diatomic halogen gas molecules from which stimulated laser emission is produced.

4,258,335
GAS LASER

Jerome Donon, Paris, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed Oct. 30, 1978, Ser. No. 955,746
Claims priority, application France, Nov. 24, 1977, 77 35376
Int. Cl.[3] H01S 3/08
U.S. Cl. 331—94.5 D 8 Claims



1. A gas laser comprising:

a flat plate transmission line for laser excitation and which includes:

an insulating plate;

a first metal plate which partially covers a first surface of the insulating plate, the uncovered part of the first surface forming a first peripheral strip which surrounds the edges of the first metal plate, said metal plate being divided into two distinct portions by a rectilinear slot;

an induction coil having terminals connected respectively to the two portions of the first metal plate;

a second metal plate partially covering the second surface of the insulating plate, the uncovered part of the second surface forming a second peripheral strip which surrounds the edges of the second metal plate and is of a width less than that of said first peripheral strip;

means for maintaining an active gaseous medium in the slot;

means for establishing an electric tension between the first

and second metal plates, in order to set up an electric field in the insulating plate;

means for setting up an electric discharge between one portion of the first metal plate and the second metal plate so as to form a current wave in the flat plate transmission line, the wave being suitable for generating, in the active gaseous medium, a laser beam which propagates through the slot; the improvement comprising:

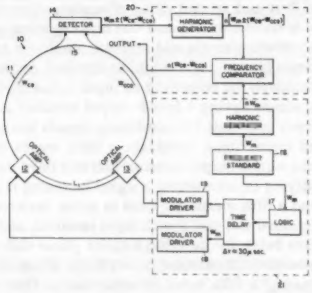
means disposed on the first surface of the insulating plate for reducing progressively the surface electric field on the insulating plate from the edge of the first metal plate to the edge of the insulating plate when the current wave is flowing through the plate transmission line.

4,258,336

PULSED RING LASER FIBER GYRO

Paul C. Fletcher, El Cajon, and Verne E. Hildebrand, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 20, 1979, Ser. No. 59,405
Int. Cl.³ H01S *3/083*
U.S. Cl. 331—94.5 C **4 Claims**



1. An improvement for a ring laser which improves the resolution at low rotation rates comprising:

means for forming a closed optical path;

a first and a second light amplifying means optically coupled to the closed optical path;

means coupled in the closed optical path for detecting optical beat signals; and

means coupled to the first and second light amplifying means for initiating clockwise and counterclockwise pulsed optical signals in the closed optical path in a sequence to assure their noncoincidental passage through the first and second amplifying means and their coincidental passage through the detecting means.

4,258,337

STABILIZED OUTPUT POWER OSCILLATOR

James R. Clinton, Seattle, Wash., assignor to Huntron Instruments, Inc., Lynnwood, Wash.

Filed Sep. 10, 1979, Ser. No. 73,888
Int. Cl.³ H03B *5/26*
U.S. Cl. 331—110 **11 Claims**

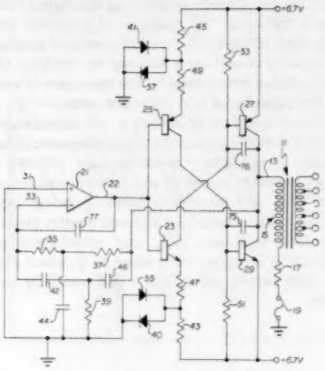
1. A power oscillator, comprising:

differential amplifier means responsive to an input signal for producing an amplified output signal;

first signal amplifying means responsive to the amplified output signal for providing the positive half-cycle of the oscillator output signal;

second signal amplifying means responsive to the amplified output signal for providing the negative half-cycle of the oscillator output signal;

AC feedback means connected between the output of the oscillator and the inverting input of said differential amplifier means for regenerative feedback of the AC portion of the oscillator output signal; and



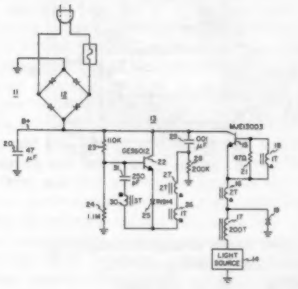
DC feedback means connected between the output of the oscillator and the inverting input of said differential amplifier means for degenerative feedback of the DC portion of the oscillator output signal.

4,258,338

PULSE GENERATOR PRODUCING SHORT DURATION HIGH CURRENT PULSES FOR APPLICATION TO A LOW IMPEDANCE LOAD

William Peil, North Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,253
Int. Cl.³ H03K *3/30*
U.S. Cl. 331—111 **7 Claims**



1. A relaxation oscillator for generating short duration, high current pulses at a stable repetition rate, comprising:

A. a source of dc potentials having a first and a second output terminal,

B. a resistor having one terminal connected to said second source output terminal,

c. a junction transistor having base, emitter and collector electrodes, the collector thereof being coupled in a first low resistance, conductive path to said first source output terminal, the emitter thereof being coupled in a second low resistance, conductive path to the other terminal of said resistor,

D. means to establish the base electrode at a potential intermediate to that of said dc source terminals,

E. a capacitor which is alternately charged and discharged having a first terminal coupled to the other terminal of said resistor and through said second path to said emitter

and a second terminal coupled to one of said source output terminals, the potential across said capacitor establishing the potential on said emitter electrode relative to said base electrode and thereby controlling the state of conduction of said transistor; the duration of transistor conduction being determined by the level of transistor conduction and the capacity of said capacitor; and the duration of nonconduction being determined by the resistance of said resistor and the capacity of said capacitor, and

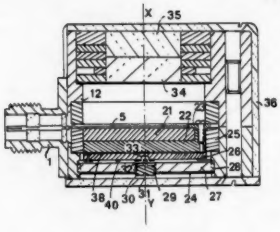
F. a current transformer having a low impedance primary winding closely coupled through a magnetic core to a low impedance secondary winding, said primary winding being connected in one of said low resistance conductive paths, and said secondary winding being capacitively coupled between said base and said emitter electrodes in a third low resistance path, said transformer providing feedback in a regenerative sense to produce short duration, high current pulses when said transistor conduction occurs.

4,258,339

LUMPED CIRCUIT CIRCULATOR WITH ADJUSTABLE BAND WIDENING CIRCUIT

Nicolle Bernard, and Jean-Rene Mahieu, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Conflans-Ste. Honorine, France

Filed Mar. 1, 1979, Ser. No. 16,442
Claims priority, application France, Mar. 3, 1978, 78 06094
Int. Cl.[3] H01P *1/387*
U.S. Cl. 333—1.1 **4 Claims**



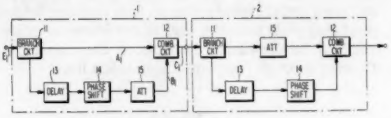
1. A lumped circuit circulator comprising:
a nonreciprocal gyromagnetic disc;
a microstrip circuit on said disc;
three coaxial ports electrically connected to said microstrip circuit;
means for establishing a d.c. magentizing field in said disc;
a printed circuit having a recess centrally provided in the lower face thereof;
a metallic member positioned between said disc and said printed circuit to function as a ground plane;
a metallic casing housing said circulator; and
an adjustable band widening circuit including:
a strip line circuit deposited on said lower face of said printed circuit, said strip line circuit having a central metallized part surrounding said recess;
movable metallic cover means threadedly connected to one end of said casing for adjustment with respect thereto, said cover means having a centrally located threaded bore; and
a movable plunger disposed in said threaded bore, said plunger extedning into said recess in said printed circuit.

4,258,340

AMPLITUDE EQUALIZER

Toshihiko Ryu, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1979, Ser. No. 29,503
Claims priority, application Japan, Apr. 12, 1978, 53/43589
Int. Cl.[3] H03H *7/03;* **H04B** *3/04*
U.S. Cl. 333—18 **12 Claims**



1. An amplitude equalizer having a first input terminal for an input signal of a prefixed amplitude distortion within a predetermined frequency region, and a first output terminal, the amplitude vs. frequency characteristics of said amplitude equalizer being such that an amplitude equalized, distortion-eliminated output signal is provided at said first output terminal: wherein first and second unit amplitude equalizers respectively of first and second delay distortion characteristics are disposed in series between said first input terminal and said first output terminal; wherein said first unit amplitude equalizer has a first means having a second input terminal, second and third output terminals for branching an input signal applied thereto, a second means having a fourth output terminal and third and fourth input terminals for combining signals incoming at said third and fourth input terminals, a third means disposed between said second output terminal and said third input terminal for amplifying or attenuating a signal incoming thereto, and a fourth and a fifth means disposed in series between said third output terminal and said fourth input terminal, said fourth and fifth means being for delaying and for phase shifting, respectively; wherein said second unit amplitude equalizer has a sixth means having a fifth input terminal and a fifth and a sixth output terminals for branching a signal incoming thereto, a seventh means having a seventh output terminal and a sixth and a seventh input terminals for combining signals incoming at said sixth and seventh input terminals, an eight means for connecting said fifth output terminal and said sixth input terminal, a ninth, tenth and eleventh means disposed in series between said sixth output terminal and said seventh input terminal, said ninth, tenth and eleventh means being respectively for delaying, phase shifting and attenuating or amplifying signals supplied thereto; wherein said first and second delay distortion characteristics being set to complementary values to flatten the overall delay distortion characteristics of said amplitude equalizer; and wherein at least one of attenuation or amplification factor of said third and eleventh means, the delay time at each said fourth and said ninth means, the phase shift each said fifth and tenth means is changed to make said amplitude vs. frequency characteristics variable.

4,258,341

FEED FORWARD PASSIVE COUPLING SYSTEM AND METHOD

Richard V. Snyder, Lincroft, N.J., assignor to Fel Corporation, Farmingdale, N.J.

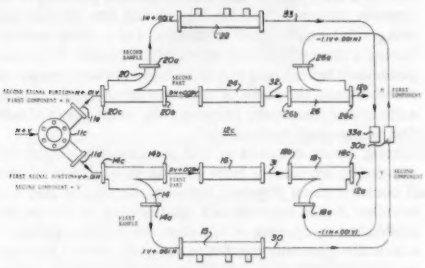
Division of Ser. No. 654,989, Feb. 3, 1976, Pat. No. 4,072,913.
This application Jan. 3, 1978, Ser. No. 866,692
The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.
Int. Cl.[2] H01P *5/12, 5/18*
U.S. Cl. 333—109 **6 Claims**

1. A feed forward passive coupling system for separation of at least a first and a second signal portion into components where (1) said first signal portion has a majority of a second signal component and a minority of a first signal component

and (2) said second signal portion has a majority of a first signal component and a minority of a second signal component,

means for coupling out and phase shifting a first sample of the first signal portion, said means also producing a first part of the first signal portion,

means for coupling out and phase shifting a second sample of the second signal portion, said means also producing a second part of the second signal portion,



first means for combining said phase shifted second sample and said first part for producing substantially the second component, and

second means for combining said phase shifted first sample and said second part for producing substantially the first component.

4,258,342

ELASTIC SURFACE WAVE DEVICE

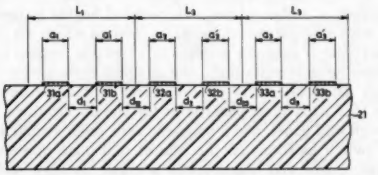
Hajime Miyajima, Sakado, and Akio Nakakura, Kawagoe, both of Japan, assignors to Toko, Inc., Tokyo, Japan

Filed Aug. 24, 1979, Ser. No. 69,320

Claims priority, application Japan, Aug. 28, 1978, 53/116727[U]

Int. Cl.³ H03H *9/145, 9/25, 9/42, 9/64*

U.S. Cl. 333—151 **4 Claims**



1. An elastic surface wave device including interdigital finger electrode means provided on an elastic surface wave propagating medium, said interdigital finger electrode means comprising interdigital fingers each consisting of a pair of divided finger elements, said pair of divided finger elements having an equal width, the spacing between adjacent ones of said interdigital fingers being equal to the spacing between the pair of divided finger elements thereof, characterized in that at least one of said interdigital fingers is differentiated from the remainder of said interdigital fingers in respect of the distance from the center of the spacing between one of said interdigital fingers and that one of said interdigital fingers which is adjacent thereto on one side to the center of the spacing between said one interdigital finger and that one of said interdigital fingers which is adjacent thereto on the other side.

4,258,343

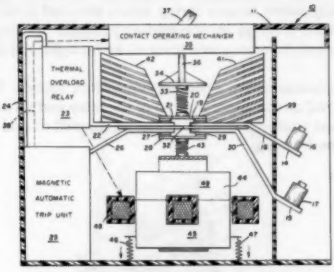
UNITIZED COMBINATION STARTER

Frank W. Kussy, Randallstown, Md., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 12, 1979, Ser. No. 11,611

Int. Cl.³ H01H *73/00, 77/10*

U.S. Cl. 335—6 **10 Claims**



1. A circuit interrupter including first and second terminals for connecting said interrupter in an external circuit, conductive elements extending between said terminals and defining an internal series circuit having first and second closely spaced elongated sections through which currents flow in opposite direction to generate electrodynamic forces urging said sections away from each other; said first section including stationary first and second contacts spaced along the length of said first section with a first gap therebetween, and a movable first bridging contact extending across said first gap; selectively operable first means for moving said first bridging contact into and out of engagement with said first and second contacts; and first biasing means connected to said first bridging contact to provide contact pressure at said first and second contacts while urging said first bridging contact toward said second section; said second section including stationary third and fourth contacts spaced along the length of said second section with a second gap therebetween, and a movable second bridging contact extending across said second gap; selectively operable second means for moving said second bridging contact into and out of engagement with said third and fourth contacts; second biasing means connected to said second bridging contact to provide contact pressure at said third and fourth contacts while urging said second bridging contact toward said first section; said first means including a first automatic trip device for causing said first means to disengage said first bridging contact from said first and second contacts responsive to detecting first predetermined fault current conditions; said second means including a second automatic trip device for causing said second means to disengage said second bridging contact from said third and fourth contacts responsive to detecting second predetermined fault current conditions; said first and second biasing means being proportioned so that upon the occurrence of severe overcurrent conditions electrodynamic forces acting in opposite directions on said first and second bridging contacts cause them to separate from the first, second, third and fourth contacts before either said first or second means is effective to open said interrupter.

4,258,344

SMALL-SIZED POWER RELAY

Ichiro Nishimi, Tokyo, Japan, assignor to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, Japan

Continuation-in-part of Ser. No. 27,459, Apr. 5, 1979, abandoned, which is a continuation of Ser. No. 862,851, Dec. 21, 1977, abandoned. This application Jul. 12, 1979, Ser. No. 57,075

Int. Cl.³ H01H *67/02*

U.S. Cl. 335—129 **7 Claims**

1. A small-sized power relay used in combination with an

electronic type thermostat for automatic control of an air conditioner comprising

(a) an open-top relay section housing;

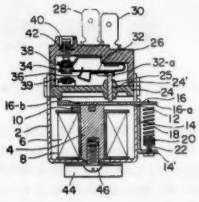
(b) an electromagnet disposed in said housing adapted to be energized and de-energized by external signals;

(c) a magnetizable lever pivotally supported relative to to said housing and extending within the magnetic field of said electromagnet;

(d) an adjustable tension spring means attached to said magnetizable lever at its one end and to said housing at its other end for urging said lever away from the electromagnet;

(e) a non-conductive open-bottom switch section housing attached on the upper portion of the relay section housing;

(f) a fixed contact mounted on the inside wall of said switch section housing;



(g) a movable contact means provided opposite said fixed contact within said switch section housing, said movable contact means including leaf spring means attached to said inside wall of the switch section housing at its one end and carrying a movable contact at its other end for normally pressing said movable contact onto said fixed contact; and

(h) push rod means for transmitting a lever action attributable to said adjustable tension spring means to said leaf spring means, the urging force of said lever action being capable of adjustment to be greater than the urging force of said leaf spring means but less than a resultant force of the urging force of said leaf spring means and the magnetic attraction exerted on said lever when said electromagnet is energized whereby said movable contact is kept pressed onto said fixed contact during the energization of the electromagnet and detached from the same during its de-energization.

4,258,345

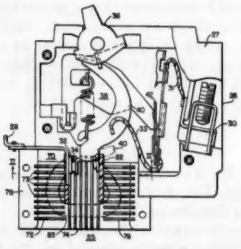
CIRCUIT INTERRUPTER WITH MAGNETIC ARC STRETCHER

Franklin S. Malick, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 29, 1979, Ser. No. 7,523

Int. Cl.[3] H01H *9/30, 33/04*

U.S. Cl. 335—201 **12 Claims**



1. A circuit breaker, comprising:

a housing;

separable contacts disposed in said housing;

an operating mechanism operable to move said contacts between open and closed positions;

an arc stretcher device comprising a first portion having a first plurality of substantially parallel U-shaped plates of magnetic material each having two legs and a bight portion connected therebetween, a second portion having a second plurality of substantially parallel U-shaped plates each having two legs and a bight portion connected therebetween, the plates of said second portion pointing in an opposite direction from the legs of said first portion and being substantially parallel thereto, and a third portion having a third plurality of substantially parallel U-shaped plates each having two legs and a bight portion connected therebetween, the plates of said third portion extending in a direction substantially perpendicular to the plates of said first and second portions; and

insulating means disposed in said arc stretcher device for preventing arc current from flowing through said plates;

said contacts being disposed between the legs of said arc stretcher device opposite said third portion so that an arc established by opening of said contacts initially extends in a direction generally parallel to the plates of said first and second portions and is rapidly driven by magnetic action into the area between the legs of said plates to stretch said arc, develop a high arc voltage, and provide current limiting action.

4,258,346

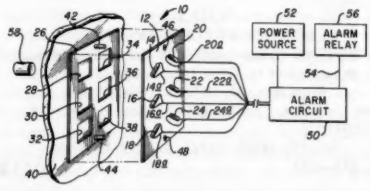
MAGNETICALLY ACTUATED DIGITAL SWITCH

Roger W. Williams, 7294 Glenview, Fort Worth, Tex. 76118

Filed Feb. 9, 1979, Ser. No. 11,060

Int. Cl.[3] H01H *50/06, 36/00*

U.S. Cl. 335—206 **5 Claims**



1. A magnetically actuable digital code switch comprising in combination, a plate of magnetic material having an operating face with multiple switch locations thereon which are defined in said plate of magnetic material by a two dimensional array of uniform holes therethrough, one of which defines each of said switch locations, means to secure said operating face of said plate to a fixed glass panel with the switch locations visible through said panel, and a magnetic reed relay switch at each said switch locations on the side of said plate opposite said operating face and magnetically actuable through said glass panel and through the holes in said plate.

4,258,347

MAGNET COIL

Ferdinand Konig, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 12, 1978, Ser. No. 968,691

Claims priority, application Switzerland, Dec. 15, 1977, 15436/77

Int. Cl.[3] A01F *5/00*

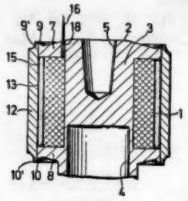
U.S. Cl. 335—282 **13 Claims**

1. A magnet coil for high operating temperatures of 400° C. and higher comprising

a temperature-resistant enclosure;

at least one gas-tight feedthrough in said enclosure;

a winding of copper wire enclosed in said enclosure and having a lead extending through said feedthrough; and



a substance in said enclosure for binding in oxygen leaking into said enclosure.

4,258,348

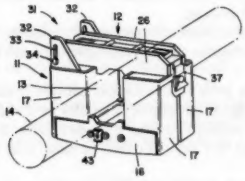
CURRENT MEASURING TRANSFORMER

Kenneth H. Belfer, Alamo; Arnold Stewart, San Leandro, and Russell Tavare, Hayward, all of Calif., assignors to STB Transformer Company, San Leandro, Calif.

Filed Nov. 13, 1979, Ser. No. 93,866

Int. Cl.³ H01F *27/28, 27/26*

U.S. Cl. 336—73 **7 Claims**



1. A transformer for measuring current flowing in a conductor, comprising a generally U-shaped housing, a generally U-shaped first core portion disposed in said housing, said first core portion defining a gap adapted to receive the conductor therethrough, a closure member extending across the distal ends of said housing, a second core portion disposed in said closure member and adapted to span the distal ends of said first core portion, said core portions comprising pluralities of magnetic flux-conducting panels disposed in adjacent, laminated groups, every other one of said laminated groups extending outwardly from the respective ends of said core portions and disposed so that the ends of said second core portion cooperatively engage and interleave with said distal ends of said first core portion, sliding hinge means for joining said closure member to said housing with a compound rotating-translating motion, said sliding hinge means including a pair of hinge plates extending outwardly from a distal end of said housing, a pair of slots disposed in aligned fashion in said hinge plates, and a hinge pin affixed to one end of said closure member and having end portions received in said slots in freely rotating and translating fashion, hinge block means secured to said closure member adjacent to said laminated groups extending from one of said distal ends of said first core portion, said hinge block means providing rotational clearance with said one of said ends only when said hinge pin is disposed in the distal-most portions of said slots, latch means for translating both ends of said closure member toward said housing to effect complete engagement and interleaving of said core portions, and coil means secured about one of said core portions to generate a voltage analog of the current induced in said core portions by the conductor.

4,258,349

DOUBLE-POLE ROCKER SWITCH WITH THERMAL PROTECTION

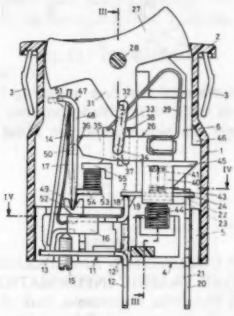
Josef Flory, Reussbühl, Switzerland, assignor to Weber A.G. Fabrik Elektrotechnischer Artikel und Apparate, Emmenbrücke, Switzerland

Filed Sep. 5, 1979, Ser. No. 72,612

Claims priority, application Switzerland, Sep. 5, 1978, 9316/78

Int. Cl.³ H01H *71/16, 73/06*

U.S. Cl. 337—46 **9 Claims**



1. A double-pole rocker switch with thermal overload protection, of flat parallelepiped form, including a toggle at one narrow end thereof and electrical contact members at the other narrow end thereof and further including a pivotable spring-loaded contact block coupled pivotably to said rocker via a toggle mechanism, said contact block supporting at the end remote from said toggle mechanism two movable contact elements which cooperate with stationary contact elements, said contact block being lockable by a pivotable latch which is displaceable by a bimetallic element and wherein, according to the invention, said switch comprises a unitary tubular housing (**1;61**) of approximately rectangular cross-section surrounding a slidably insertable singlepiece slide assembly (**4;62**) including an insulated subdivided base member (**5;63**) which supports external electrical contacts (**12,12',20,21**) and internal electrical contacts (**18,22,19,23**) and which further supports a spring (**44**) which loads said springloaded contact block (**26;70**) and defining a pivotal bearing (**52**) for said pivotable latch (**47**), said base member (**5;63**) having at least one carrier wall (**6,7;64**) for supporting said rocker (**27;65**) and for guiding a pin member (**34;75**) forming part of said toggle mechanism, said pin member (**34;75**) being longitudinally displaceable in said carrier wall (**7;64**) and pivotally supporting said contact block (**26;70**).

4,258,350

ARRANGEMENT OF PLUG-IN TYPE FUSES ON A MOUNTING BOARD

Kiyoto Watanabe, Yokohama, and Syuichi Otani, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 29, 1979, Ser. No. 25,144

Claims priority, application Japan, Mar. 30, 1978, 53-41840[U]

Int. Cl.³ H01H *85/16*

U.S. Cl. 337—198 **3 Claims**

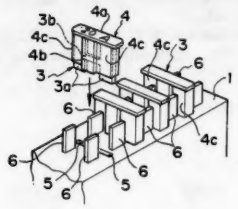
1. A plug-in fuse arrangement comprising:

a fuse mounting board having a plurality of socket openings,

mulitiple fuse assemblies each including a plate-like fuse body having two terminal-forming, parallel, bottom-end blade portions,

a vertically elongate housing for each fuse assembly, enclosing the fuse body and leaving exposed the bottom ends of the blade portions, and

retaining pieces formed upright on said mounting board so that said vertically elongate housing is vertically and securely retained between adjacent retaining pieces and



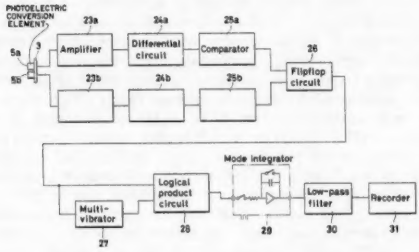
against a surface of said fuse mounting board, whereby said bottom ends of the blade portions project downwardly from the housing and are fitted in said socket openings.

4,258,351

SYSTEM FOR COLLECTION AND TRANSMISSION OF ROAD TRAFFIC INFORMATION

Kiyoko Shigeta; Shuntetsu Matsumoto, both of Kodaira; Naotake Ooyama, Kanagawa, and Takashi Imai, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,694
Claims priority, application Japan, Nov. 26, 1977, 52/142036
Int. Cl.[3] G08G *1/04;* G08B *13/18*
U.S. Cl. 340—38 P **5 Claims**



1. A system for the collection and transmission of traffic information, which comprises:

a lens system disposed at a position at which said lens system is angled so as to include in the focal plane thereof a road area selected for the purpose of collection of traffic information,

a plurality of photoelectric conversion elements arranged on said focal plane of said lens system along the direction of the image of the road area formed on said focal plane,

a plurality of differential circuits for individually differentiating electric signals issuing from said plurality of photoelectric conversion elements, and

a plurality of comparators for individually converting differentiated signals issuing from said plurality of differential circuits into pulse signals,

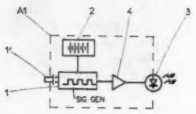
wherein said plurality of photoelectric conversion elements arranged in the image of said road area formed on the focal plane are formed in shapes successively decreased in width and length in conformity with the perspective view of the traffic lane formed on said focal plane.

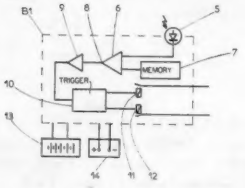
4,258,352

CONTROL DEVICE FOR VEHICLE LOCKS

Paul Lipschutz, Croissy, France, assignor to Neiman, S.A., Courbevoie, France

Filed Feb. 26, 1979, Ser. No. 15,387
Claims priority, application France, Mar. 17, 1978, 78 07726
Int. Cl.[3] B60Q *1/00*
U.S. Cl. 340—53 **8 Claims**





1. A device for the control of an electro-mechanical locking and unlocking member of at least one lock of an automobile vehicle, comprising:

(a) a transmitter independent of the said vehicle, said transmitter comprising:

(1) a direct current electric supply source,

(2) a coded pulse signal generator drivable by said supply source,

(3) and an infra-red radiation emitter connected to said coded signal generator whereby said radiation emitter outputs infra-red pulses in coded form; and

(b) a receiver fast with the said vehicle, said receiver comprising:

(1) detector means for the reception of the infra-red pulses,

(2) a memory programed to emit coded pulses identical to said coded pulses from the emitter,

(3) a comparator coupled to the outputs of said detector means and said memory, and arranged to emit a signal in the case of agreement between the transmitter and receiver pulses, and

(4) an amplifier connected to the output of said comparator, wherein on application by the user of the correct transmitter in close proximity to the receiver, the coded pulses from the emitter pass to the detector means whereby the output signals therefrom are compared with the output of the memory to provide an output signal from the comparator for actuating the locking member.

4,258,353

VEHICLE ACCELERATION/DECELERATION WARNING SYSTEM

Robert W. Carlson, 410 Getzville Rd., Amherst, N.Y. 14226

Filed Dec. 13, 1979, Ser. No. 103,410
Int. Cl.[3] B60Q *1/26;* H01H *35/14*
U.S. Cl. 340—71 **14 Claims**

1. An electronic acceleration and deceleration warning system for a vehicle comprising:

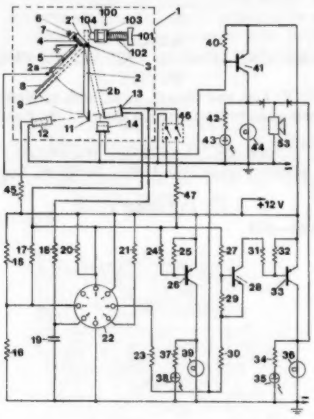
(a) a radiant energy source means for supplying radiant energy to first and second radiant energy sensor means, said first radiant energy sensor means having resistance which is variable in proportion to the amount of radiant energy received;

(b) a pendulum adapted to control the amount of radiant energy received by said radiant energy sensor means from

said radiant energy source means in response to angular displacement of said pendulum around a pivot point;

(c) an oscillator circuit having a variable frequency output signal;

(d) a deceleration threshold switch means for switching on the output signal of said oscillator circuit in response to a minimum angular displacement of said pendulum in one direction;



(e) first and second alternately flashing deceleration warning lights having their rates of flashing dependent upon the frequency of said oscillator output signal when said oscillator output signal is switched on; and

(f) an acceleration threshold switch means for turning on an acceleration warning signal in response to a minimum angular displacement of said pendulum in a second direction.

4,258,354

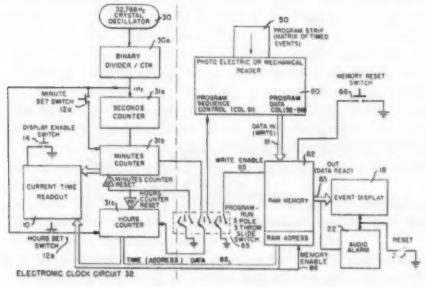
PORTABLE ALARM DEVICE

Amiram Carmon, 35 Ruth St.; Yair Friedman, 12 Burca St., both of Haifa, Israel 32000, and Robert S. Savin, 1025 Nautilus La., Mamaroneck, N.Y. 10543

Filed May 11, 1979, Ser. No. 38,321

Int. Cl.[3] G08B 7/06

U.S. Cl. 340—309.4 **18 Claims**



1. A portable alarm for giving preselected warnings at preselected times comprising:

a clock generator for generating time signals;

means for translating said time signals into a plurality of selected time signal outputs each corresponding to different times;

a plurality of actuatable warning devices; and

selector means for activating selected warning devices in response to one or more of the selected time signal outputs and an activation schedule stored in a memory means, said schedule including information on the selected time signal outputs and selected warning devices for each such time signal output.

4,258,355

DIGITAL TO ANALOGUE CONVERTERS

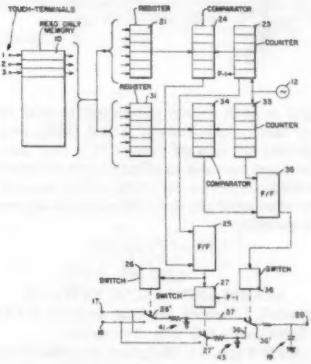
Colin W. Edwards, Lightwater, England, assignor to Hughes Microelectronics Limited, Glenrothes, Scotland

Continuation of Ser. No. 764,104, Jan. 31, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,796

Claims priority, application United Kingdom, Feb. 5, 1976, 4637/76

Int. Cl.[2] H03K 13/02

U.S. Cl. 340—347 DA **9 Claims**



1. A digital to analogue converter comprising:

means for producing a first series of pulses whose average value is representative of a first group of the bits of an applied digital signal, said first group of bits being comprised of less than all the bits of said applied digital signal;

a first filter circuit coupled to process said first series of pulses;

means for producing a second series of pulses whose average value exceeds that of the first series of pulses by a preselected fixed amount;

a second filter circuit coupled to process said second series of pulses;

a third filter circuit; and

means for alternately applying the output signals from said first or second filter circuits to said third filter circuit such that the percentage of the time respective ones of the output signals from said first or second filter circuits are applied to said third filter circuit is proportional to the value of the remaining bits of the applied digital signal; whereby

the output signal from said third filter circuit is an analogue representation of the applied digital signal.

4,258,356

MULTI BAR ENCODING APPARATUS UTILIZING ACOUSTIC ENERGY

Vincent P. Jalbert, Middlebury, Conn., assignor to SCM Corporation, New York, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,814

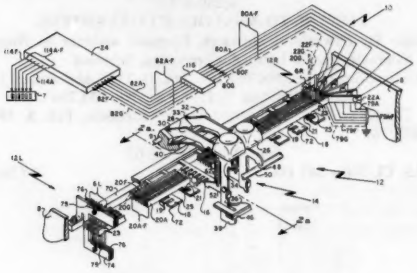
Int. Cl.[3] G06F 3/02; H04L 15/03

U.S. Cl. 340—365 R **37 Claims**

1. An apparatus for generating an n-bit code representative of a mechanical motion for output to a utilization device comprising:

(a) n members for transmitting vibratory energy,

(b) means supporting said n members in vibratory isolation,
(c) means for inducing vibratory energy within at least a selected one of said n members in response to said mechanical motion,
(d) means operatively connected to each of said n members for transducing said induced energy into a respective bit of said n-bit code, and



(e) output control means connected to said transducing means, said output control means being responsive to transducing of induced energy in a first one of said n members and operable to effect output of the n-bit code to said utilization device only after a time interval sufficient for transducing of any induced energy in the remainder of said n members.

4,258,357

ALARM SIGNALLING SYSTEMS

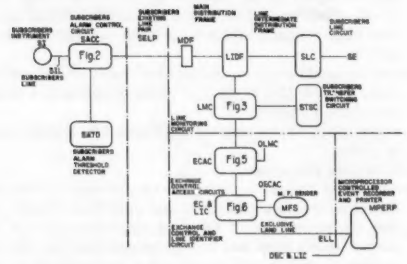
Leslie J. Browell, Liverpool, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jun. 22, 1979, Ser. No. 51,184

Claims priority, application United Kingdom, Jun. 24, 1978, 27816/78

Int. Cl.³ G08B *25/00*

U.S. Cl. 340—506 **12 Claims**



1. A remote alarm signalling system comprising protected premises and a telecommunications exchange, and further comprising:
(i) at each protected premises, detector means for detecting the presence of an alarm condition and alarm signalling means responsive to the detector means and connected to a telecommunications line serving the protected premises and terminated on a telecommunications exchange, the alarm signalling means being arranged to apply to the telecommunications line a characteristic signal when the alarm detector is primed and to remove the characteristic signal from the line when the detector means detects the alarm condition and
(ii) at the telecommunications exchange, for each telecommunications line having an alarm signalling means for providing an alarm connected to it, monitoring means connected to the line for detecting the application and removal of the characteristic signal, and a common alarm identification circuit connected to the monitoring means and taken into use by the monitoring means when said monitoring means detects that the characteristic signal has been removed from the line, and wherein the common alarm identification circuit is arranged to generate coded signals indicative of the identity of the alarm condition for display at an alarm monitoring equipment.

4,258,358

DOOR OPENING SENSING AND ALARM PRODUCING DEVICE

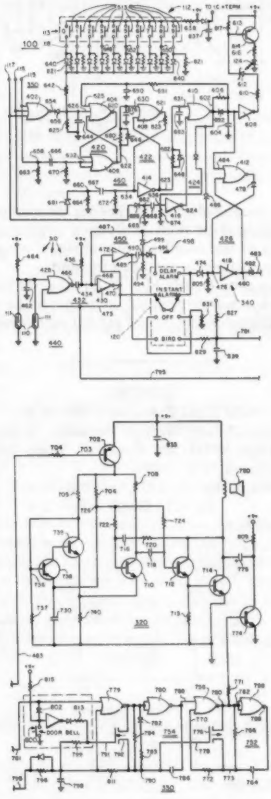
Thomas K. P. Lee, and Hau C. Lam, both of Kowloon, Hong Kong, assignors to International Quartz Ltd., Kowloon, Hong Kong

Filed Aug. 14, 1979, Ser. No. 66,498

Claims priority, application United Kingdom, Aug. 16, 1978, 33543/78

Int. Cl.³ G08B *13/08*

U.S. Cl. 340—543 **58 Claims**



1. A door opening sensing and alarm producing device for mounting to a door and door frame assembly and including audio alarm circuit means for generating an audio alarm, control circuit means coupled to said alarm circuit means for controlling operation of said alarm circuit means, signal generating means for sensing when the door has been opened and for generating an alarm signal, said signal generating means being coupled to said control circuit means for supplying an alarm

signal thereto for causing said control circuit means to operate said alarm circuit means, and programmable alarm inhibiting circuit means coupled to said control circuit means and including first means for storing a predetermined code, second means for presenting a code to said alarm inhibiting circuit means, and third means for comparing the presented code with the stored predetermined code and, when the code presented is presented in a proper time sequence and corresponds with the predetermined code, for producing an alarm inhibit signal which is supplied to said control circuit means for inhibiting or stopping said control circuit means from operating said audio alarm circuit means.

4,258,359

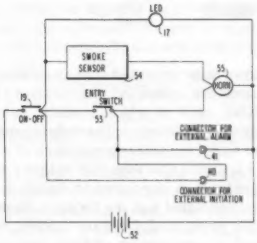
PORTABLE PROTECTIVE DEVICE

Philip McLamb, 3301 Barnsley La., Raleigh, N.C. 27604

Continuation-in-part of Ser. No. 845,094, Oct. 25, 1977, abandoned. This application Nov. 14, 1978, Ser. No. 960,540

Int. Cl.³ G08B *19/00*

U.S. Cl. 340—546 **15 Claims**



1. An adaptable, self-contained protection device for providing a warning upon detection of combustion products, and optionally a warning of intrusion, which can be installed on a temporary basis in a variety of locations, and removed without leaving evidence of its installation, or can be permanently installed, said device comprising:

a casing with plural surfaces,

a circuit installed within said casing including a battery, and connected thereto a series circuit including a combustion products sensor, an electrically operated audible warning device and at least a further switch connected across said combustion products sensor,

and on ON-OFF switch in series with said combustion products sensor,

said further switch having a spring-biased operating lever mounted on said casing, said lever having at least operative, operated, and reset positions, with said spring biasing said lever to said operated position, said further switch operated to a closed position when said operating lever is in its operated position, and a lever retaining means mounted on said casing to maintain said lever in said reset position when said lever is engaged with said retaining means against said spring-bias, said further switch having an open condition when said operating lever is in either said operative or reset positions,

a power ON indicator with visible output connected in parallel across said combustion product sensor and said electrically operated audible warning device,

mounting means for said casing adjacent one of said surfaces including a retaining means having an arm and a generally perpendicular lip portion adapted to mount said device to a support by engaging said lip portion over an edge of said support,

said mounting means including a recess in said casing in which said arm portion is slidably received, and spring biasing means biasing said retaining means lip portion toward a surface of said casing,

said casing surfaces including a plurality of openings communicating with said combustion products sensor and said audible warning device by providing an air draft to said combustion product sensor and for conducting audible warning signals produced by said audible warning device through said casing surface, said casing surface including an additional opening through which at least a portion of said ON-OFF switch extends, and another opening through which a visible signal from said indicator is viewable.

4,258,360

OPTICAL SMOKE DETECTOR

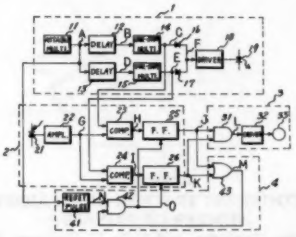
Hiroshi Tagashira, Chofu, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed Jul. 31, 1978, Ser. No. 929,714

Claims priority, application Japan, Sep. 2, 1977, 52-105519

Int. Cl.³ G08B *17/10*

U.S. Cl. 340—630 **1 Claim**



1. An optical smoke detector, comprising a chamber permitting entrance of smoke, a light source for emitting a light in said chamber, a light sensing element in said chamber for converting incident light produced by the presence of smoke in said chamber into an electrical signal, an alarm device for producing an alarm in response to said electric signal, means for generating a train of dual actuating pulses with said dual pulses occurring within a predetermined period of time and applying said dual pulses to said light source to flash it twice within said period of time, means for detecting dual pulses produced by said light sensing element synchronously with said dual actuating pulses and means for producing an alarm driving signal in response to detection of said dual pulses which are synchronous with said dual actuating pulses.

4,258,361

DISPLAY SYSTEM HAVING MODIFIED SCREEN FORMAT OR LAYOUT

Alan F. Hydes, North Baddesley, and Alan L. Jones, Chandlers Ford, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1979, Ser. No. 24,481

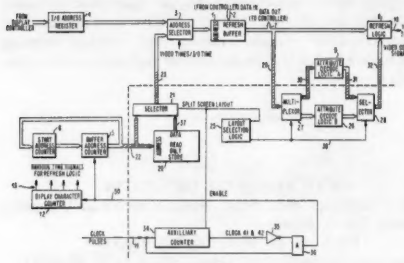
Claims priority, application United Kingdom, Mar. 31, 1978, 12591/78

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—721 **9 Claims**

1. A display system comprising a scanned refresh display device, a refresh buffer having storage positions for data to be displayed and address generating means arranged to address the refresh buffer in a first sequence of addresses to display the data in a first screen layout, characterized by a translation store addressable by said first sequence of addresses to read out a modified address for each address of said first sequence to provide a sequence of translated addresses arranged to address the refresh buffer to display the data in a second screen layout,

and selection means operable in a first mode to switch said first sequence of addresses to the refresh buffer and operable in a



second mode to switch said modified sequence of translated addresses to the refresh buffer.

4,258,362

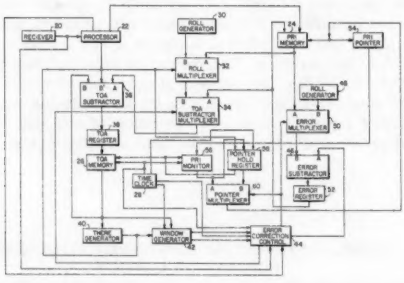
PHASE COHERENT TRACKER OF AN ARBITRARY NUMBER OF SIGNALS

Joel E. Brown, Baltimore, and Kelly C. Overman, Pikesville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 649,299, Jan. 15, 1976, abandoned. This application Sep. 26, 1979, Ser. No. 78,879

Int. Cl.³ G01S *13/70*

U.S. Cl. 343—7.3 **14 Claims**



1. In a signal tracker, apparatus for predicting arrival times of pulse signals contained in a pulse signal train as detected by a receiver of said tracker, said pulse signal train having multiple level staggered pulse repetition intervals, said apparatus comprising

means for storing predetermined values representative of said multiple level staggered pulse repetition intervals in said pulse signal train;

means for establishing a phase coherent order in which said predetermined values of said storing means are selected for counting by said counting means; and

means coupled to said establishing means and said counting means, for regulating the counting operation of said counting means based on said phase coherent order of said establishing means.

4,258,363

PHASED ARRAY RADAR

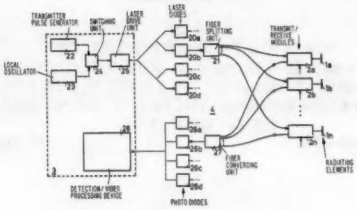
Maximiliaan H. Bodmer, Hengelo; Hendrik Hoogstraate, Delden, and Gerrit Van Rooyen, Haaksbergen, all of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Jul. 3, 1979, Ser. No. 54,533

Claims priority, application Netherlands, Jun. 30, 1978, 7807170

Int. Cl.³ G01S *13/06*

U.S. Cl. 343—16 R **4 Claims**



1. Phased array radar provided with an antenna of which the radiating elements are connected to associated r.f. transmitter-receiver modules, each of which modules being fed with a transmitter signal and a local oscillator signal and, upon reception of an echo signal via said antenna, each of which modules delivering an i.f. signal, characterized in that a system of fiber optical waveguides is incorporated to distribute to said modules the transmitter signal and the local oscillator signal, both of which signals being modulated on carriers, which are frequency-matched to said system of fiber optical waveguides, where each of said modules comprises a demodulator to procure the transmitter signal and the local oscillator signal from the applied modulated signals.

4,258,364

DISPLAY DEVICE HAVING ADJOINING DISPLAY ELEMENTS, AND A METHOD OF PRODUCING THE DISPLAY DEVICE

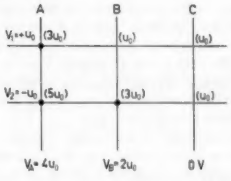
Meinolph Kaufmann, Fislisbach, and Allan R. Kmetz, Nussbaumen, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Dec. 20, 1977, Ser. No. 862,541

Claims priority, application Switzerland, Dec. 24, 1976, 16302/76

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—765 **3 Claims**



1. In a display device for displaying information in the form of a column by controlling a plurality of display elements forming the display device, said display elements adjoining one another and disposed geometrically in at least one row, each of said display elements having an electro-optical medium arranged between a front and a rear electrode and optically activated by a differential voltage applied to said electrodes and exceeding a threshold, selected front electrodes of said display elements being connected to form segment electrodes, selected rear electrodes being connected to form group elec-

trodes, and the segment and group electrodes being controlled by electrical drive signals having a rectangular wave form, the improvement comprising:

means for applying two identical first drive signals having a phase shift of π relative to one another and having an amplitude (u_o) corresponding at least to the threshold voltage of the electro-optical medium to two adjacent segment electrodes (a_1, b_1, c_1; a_2, b_2, c_2) adjoining each other in a row of display elements having a common group electrode, said first drive signals being bipolar square waves;

means for applying a second drive signal identical with one of said first drive signals, however, having a two-fold amplitude ($2\ u_o$) to a group electrode (B) comprising activated (b_3B, b_2B) and non-activated (b_1B) display elements;

means for applying a third drive signal to a group electrode (A) comprising exclusively activated display elements (a_1A, a_2A, a_3A), said third drive signal having values of frequency, phase and amplitude such that the threshold voltage of the electro-optical medium is smaller than the differential voltage across said group electrode (A) comprising exclusively activated display elements (a_1A, a_2A, a_3A) and respective segment electrodes; and

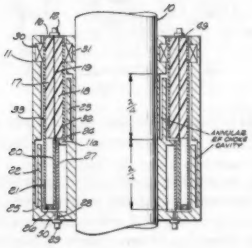
means for applying a zero drive signal to a group electrode (C) comprising exclusively non-activated display elements (c_1C, c_2C, c_3C).

4,258,365

AROUND-THE-MAST ROTARY ANNULAR ANTENNA FEED COUPLER

George A. Hockham, Valencia, and Ronald I. Wolfson, Northridge, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 7, 1979, Ser. No. 101,258
Int. Cl.³ H01Q *3/00*
U.S. Cl. 343—763 **12 Claims**



1. An around-the-mast rotary coupler for transferring radio frequency signals between a rotating antenna system or the like and physically fixed circuit apparatus comprising:

a generally axially-elongated housing of cylindrical outer shape and of annular cross-section having a generally cylindrical central axial opening whereby said housing may be mounted with said mast passing generally coaxially through said cylindrical opening;

a first plurality of fixed elongated conductive loops extending generally axially within a first axial portion of the axial length of said housing and uniformly distributed circumferentially, said fixed conductive loops having their axial centerlines mutually parallel;

a plurality of first ports one for each of said first loops discretely providing external connection to each of said first loops;

a rotatable assembly within said housing comprising a plurality of second axially elongated conductive loops mounted on said rotatable assembly in a second uniformaly spaced circumferential arrangement, the lateral dimensions of said first and second loops being tangent to respective concentric circles of different radius, said first and second loops thereby maintaining an electromagnetic coupling relationship as said rotatable assembly is rotated about the centerline of said axial opening;

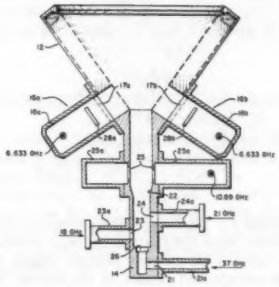
and a plurality of second ports mounted on said rotatable assembly, one for each of said second loops discretely providing an external connection to each of said second loops.

4,258,366

MULTIFREQUENCY BROADBAND POLARIZED HORN ANTENNA

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Kenneth A. Green, N. Andover, Mass.

Filed Jan. 31, 1979, Ser. No. 8,209
Int. Cl.³ H01Q *13/00*
U.S. Cl. 343—786 **4 Claims**



1. A multifrequency, broadband horn antenna comprising

a ring loaded corrugated conical horn having a large diameter end and a small diameter end, said small diameter end having a common axis with said large diameter end and said conical horn being open at the large diameter end thereof, and having at least one diametrically opposed pair of ports at a position near the small diameter end for feeding a colinear signal of low frequency, and

a multiplexer for simultaneously feeding additional colinear frequency signals spaced over multiple octaves into said conical horn through said small diameter end, said multiplexer comprising a waveguide having a plurality of ports, and means for fixing standing waves of signals fed into said waveguide, at least one port for each additional colinear frequency signal, said ports being spaced along said waveguide with the port for the highest frequency signal at the end furthest from said small diameter end, and the ports for the intermediate frequency signals spaced between the end of the waveguide and the small diameter end, each intermediate colinear signal port having connected thereto a low pass filter to reject frequencies above the frequency fed into the port through the filter, and at least one port for a lower frequency than the highest being at a position corresponding to the standing wave null of a higher frequency for isolation from signals of the higher frequency.

4,258,367

LIGHT SENSITIVE JET INKS

Ishwar R. Mansukhani, Neenah, Wis., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed Mar. 29, 1979, Ser. No. 25,115
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—1.1 **10 Claims**

1. A process for information recording comprising producing a fine jet of liquid containing a diazo light sensitive material, modulating the charge density of the jet by applying an

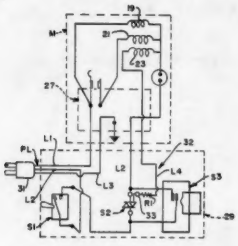
electric field in accordance with the information to be recorded, directing the jet of liquid to a recording medium to record said informtion, and thereafter subjecting said recorded information to ultraviolet light, thereby rendering the information visible.

4,258,368

SAFETY MEANS FOR PREVENTING THE AUTOMATIC RESTART OF A MOTOR

Harold D. Arnold, and Edward A. Kitsch, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 29, 1979, Ser. No. 24,908
Int. Cl.[3] H02P *3/00*
U.S. Cl. 318—762 **19 Claims**



1. Safety means for preventing the automatic restart of an AC electric motor upon the inadvertent interruption of power to the motor thereby to prevent possible injury or damage caused by the unexpected restart of the motor, said motor having a stator, a main stator winding, and power leads for supplying power to said motor, said safety means comprising means connected in one of the power leads to said main stator winding for passing current therethrough thereby enabling operation of said motor when in an operating state and for blocking the flow of current when in a non-operating state thereby preventing operation of said motor, said current passing and blocking means being in its operating state when said motor is in operation and being in its non-operating state when said motor is not in operation, a voltage pickup coil is included in the stator of said motor in which a voltage is induced upon energization of the motor for supplying a voltage output signal, and manual, momentarily operable switch means for permitting the flow of current to said motor so as to permit startup of said motor and to effect shifting of said current passing and blocking means from its non-operating to its operating state upon release of said momentary switch means and upon said motor remaining in operation, said current passing and blocking means being triggered by said voltage output signal of said voltage pickup coil so as to be in its operating state when it is supplied with said voltage output signal and to be in its non-operating state when it is not supplied with said signal.

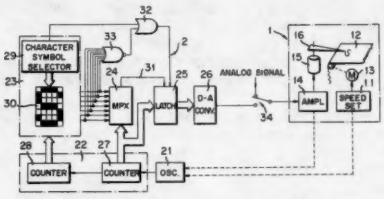
4,258,369

PEN RECORDER FOR ENABLING A RECORDING PEN TO RECORD CHARACTERS

Seisaku Hagiwara, Wakabayashi, and Fumio Matsuura, Higashikurume, both of Japan, assignors to Nihon Kohden Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1979, Ser. No. 82,614
Int. Cl.[3] G01D *9/00*
U.S. Cl. 346—62 **8 Claims**

1. A pen recorder comprising:
(a) a recording unit having a recording pen;
(b) a memory for storing data that are effective to constitute characters;
(c) a counter for generating address signals that scan the addresses of the stored data sequentially;
(d) a digital-to-analog converter for converting the stored address signals of the data into analog signals for being recorded by said recording pen.
(e) a pulse oscillator circuit for generating a train of pulses to be counted by said counter; and



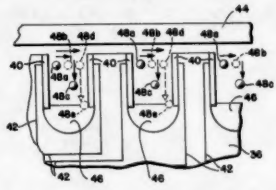
(f) a hold circuit for holding a previous address signal until a stored next address of the data is scanned.

4,258,370

JET DROP PRINTER

Suresh C. Paranjpe, Xenia, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed May 4, 1979, Ser. No. 36,214
Int. Cl.[3] G01D *15/18*
U.S. Cl. 346—75 **7 Claims**



1. An ink jet printer for depositing ink drops along a plurality of parallel print lines on a moving print receiving medium, comprising:
print head means for generating a plurality of jet drop streams directed toward said print receiving medium, said streams being arranged in a row substantially perpendicular to the direction of movement of said print receiving medium,
means for selectively charging drops in said jet drop streams to predetermined ones of a plurality of charge levels,
deflection means for providing a plurality of static drop deflecting electrostatic fields with each of said jet drop streams passing through an associated one of said fields, each of said drop deflecting fields deflecting charged drops passing therethrough in a direction which is inclined with respect to said row of jet drop streams and with respect to the direction of movement of said print receiving medium, each drop in said jet drop streams being deflected by a distance dependent upon the charge carried by the drop, and
drop catcher means, adjacent said row of drop streams and defining a drop catching surface extending substantially parallel thereto, for catching drops from each of said drop streams which are deflected sufficiently to strike said drop catching surface, whereby each of said jet drop streams selectively deposits drops along a plurality of print lines on said print receiving medium to form a print image thereon.

4,258,371

IMAGE RECORDING APPARATUS

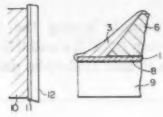
Yoichi Sekine; Yoshio Kishimoto, both of Hirakata, and Wataru Shimotsuma, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

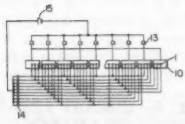
Filed Nov. 15, 1979, Ser. No. 94,588

Claims priority, application Japan, Nov. 20, 1978, 53-143700; Nov. 24, 1978, 53-145495; Nov. 24, 1978, 53-145496; Jan. 19, 1979, 54-5091; Oct. 15, 1979, 54-133254; Oct. 15, 1979, 54-133255

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **17 Claims**





1. An image recording apparatus of the kind comprising an array of styli arranged in equally spaced apart relation on the same plane and regularly electrically connected at internals of an integer of styli, an array of opposite electrodes arranged in equally spaced apart relation and in parallel with said stylus array, each of said opposite electrodes in said opposite electrode array being disposed opposite to a plurality of said styli in said stylus array, either said styli or said opposite electrodes being made of a magnetic material, and means for supplying a magnetofluidic material toward the tips of said styli or said opposite electrodes of magnetic material thereby forming protuberances of said magnetofluidic material on said tips by the magnetic force and letting the protuberances of said magnetofluidic material to selectively fly toward and onto a recording surface of a recording sheet for providing a record of a reproduced image on the recording surface of the recording sheet, wherein a pulse signal having a constant frequency is applied in dot sequential fashion to either one of said stylus array and said opposite electrode array, and a signal corresponding to an image is applied to another one.

4,258,372

SMALL CLEARANCE RETENTION APPARATUS

Chuji Ishikawa, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Apr. 6, 1979, Ser. No. 27,818

Claims priority, application Japan, Apr. 14, 1978, 53-43882; Oct. 27, 1978, 53-132338; Oct. 27, 1978, 53-132339; Oct. 31, 1978, 53-133909; Oct. 31, 1978, 53-133911; 1978, Nov. 20, 1978, 53-143170

Int. Cl.³ G01D *15/06*

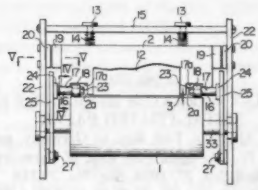
U.S. Cl. 346—153.1 **32 Claims**

32. A small clearance retention apparatus for maintaining a small clearance, in the direction parallel to a generating line of a donor drum bearing toner on the outer peripheral surface thereof, between the outer peripheral surface of said drum and a recording electrode disposed in close proximity with said drum with said small clearance with respect to said drum, said apparatus comprising:

support means for supporting said recording electrode movably in the direction toward and away from contact with the outer peripheral surface of said donor drum;

pressure application means for giving said recording electrode a movement bias toward the outer peripheral surface of said donor drum;

a pair of rollers, part of each of which is in contact with the peripheral surface at the end portions of said donor drum;



a pair of roller support means for supporting said rollers rotatably, part of said recording electrode being in contact with part of said roller support means; and

separate means supporting said roller support means separately from said drum and said recording electrode.

4,258,373

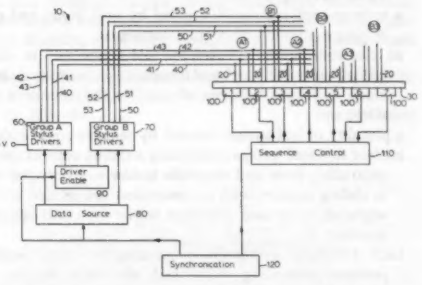
ELECTROSTATIC RECORDING APPARATUS AND METHOD

Douglas R. Arnoldi, Southbury, and William H. Todd, Jr., Sandy Hook, both of Conn., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 12,522, Feb. 15, 1979, abandoned, Continuation of Ser. No. 871,909, Jan. 24, 1978, abandoned. This application Sep. 24, 1979, Ser. No. 78,359

Int. Cl.³ G03G *15/04*; G06K *15/14*

U.S. Cl. 346—154 **8 Claims**



1. Electrostatic recording apparatus for recording on a record medium having a charge retentive surface, said system comprising

a plurality of recording electrodes arrayed in a series in contact with a record medium,

circuit means interconnecting like-numbered recording electrodes of separate arrays to establish at least two electrically independent groups of arrays, with each array of each group being separated from every other array of said group by at least one array of the other group,

a plurality of complementary electrodes mounted in a series in cooperative relationship with said record medium and aligned with said series of recording electrodes, each complementary electrode being mounted in alignment with and in operative relation with a portion of each of two adjacent groups of recording electrodes,

there being first, second, third . . . n complementary electrodes in said series, and

means for applying recording signals continuously to selected ones of said recording electrodes and simultaneously applying energizing signals to adjacent pairs of said complementary electrodes in a random sequence along said series, the energization of each pair of comple-

mentary electrodes being synchronized with the application of recording signals to said recording electrodes, each pair of energized complementary electrodes being separated by at least one complementary electrode from the previously energized pair of complementary electrodes.

4,258,374

ELECTRICALLY OPERATED DEVICE FOR MARKING METAL-COATED PAPER

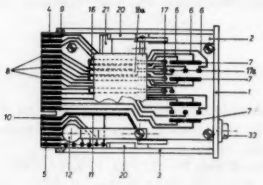
Horst Pfeiffer, Aldingen, Fed. Rep. of Germany, assignor to J. Hengstler K. G., Aldingen, Fed. Rep. of Germany

Filed Sep. 27, 1979, Ser. No. 79,314

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1978, 2845977

Int. Cl.³ G01D *15/08*

U.S. Cl. 346—163 **14 Claims**



1. An electrically operated device for marking metal-coated paper, comprising

a frame carrying a track,

a voltage-applying circuit carried by said frame and comprising a plurality of contact segments,

an electrode holder carried by said frame and in sliding contact with said track and movable relative to said circuit along said track between inoperative and operative positions, and

a plurality of leaf springs carried by said electrode holder,

each of said leaf springs comprising a sliding contact portion protruding from said electrode holder and arranged to be in sliding contact with an associated one of said contact segments when said electrode holder is in said operative position,

each of said leaf springs also comprising a marking electrode portion protruding from said electrode holder and adapted to engage said metal-coated paper when said electrode holder is in said operative position and to be lifted from said paper when said electrode holder is in said inoperative position.

4,258,375

$GA_xIN_{1-x}AS_yP_{1-y}$/INP AVALANCHE PHOTODIODE AND METHOD FOR ITS FABRICATION

Jaw J. Hsieh, Burlington, and Charles E. Hurwitz, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 9, 1979, Ser. No. 28,319

Int. Cl.³ H01L *29/161*

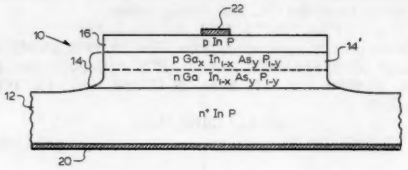
U.S. Cl. 357—16 **12 Claims**

1. An avalanche photodiode, comprising:

a. an n+ InP substrate;

b. an active layer of $Ga_xIn_{1-x}As_yP_{1-y}$ lattice-matched to said substrate and having a p-n junction sufficient to produce an avalanche effect in said photodiode;

c. a window layer lattice-matched to said substrate, said window layer having a bandgap equal to or higher than the bandgap of said active layer and being formed from



InP or a quaternary having the formula $Ga_{x'}In_{1-x'}As_{y'}P_{1-y'}$ wherein $0 \leqq x' \leqq x$ and $0 \leqq y' \leqq y$; and,

d. ohmic contacts to said avalanche photodiode.

4,258,376

CHARGE COUPLED CIRCUIT ARRANGEMENT USING A PUNCH-THROUGH CHARGE INTRODUCTION EFFECT

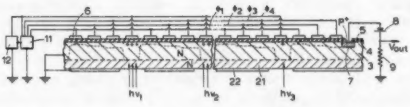
John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 781,331, Mar. 25, 1977, abandoned. This application Nov. 30, 1978, Ser. No. 965,112

Claims priority, application United Kingdom, Mar. 30, 1976, 12717/76

Int. Cl.³ H01L *29/78, 27/14, 31/00*

U.S. Cl. 357—24 **15 Claims**



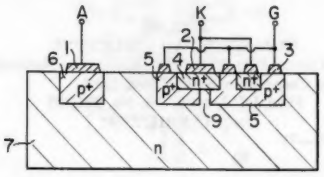
10. A charge coupled circuit arrangement for converting an electromagnetic radiation pattern in a certain wavelength band into electrical signals, comprising a body capable of being subjected to radiation in said wavelength band and having a first layer-shaped part of semiconductor material having a charge transfer register for transferring in the first layer-shaped part charge carriers representative of pattern information, an adjoining second layer-shaped part contiguous with said first layer-shaped part and comprising a photosensitive semiconductor material which yields free charge carriers when subjected to radiation within said wavelength band, and circuit means connected to the device including means to cause locally at positions associated with selected storage sites in the first layer-shaped part the punch-through to the second layer-shaped part of a depletion region formed in the first layer-shaped part to cause the direct introduction of radiation-generated free charge carriers of polarity determinative of a single conductivity type from the second layer-shaped part into said storage sites in the first layer-shaped part, said storage sites being associated with the charge transfer register and the second layer-shaped part being of an intrinsic photoconductive semiconductor material having an energy band gap less than the photon energy of radiation within said wavelength band and forming a heterojunction with the semiconductor material of the first layer-shaped part.

4,258,377

LATERAL FIELD CONTROLLED THYRISTOR

Kenji Miyata, Katsuta; Tatsuya Kamei, and Masahiro Okamura, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 12, 1979, Ser. No. 19,567
Claims priority, application Japan, Mar. 14, 1978, 53/28252
Int. Cl.[3] H01L *29/74*
U.S. Cl. 357—38 18 Claims



1. A lateral field controlled thyristor; a semiconductor substrate of a first conductivity type including a first region having a second conductivity type opposite to said first conductivity type and formed in a major surface of said semiconductor substrate, a second region of said first conductivity type having a higher impurity concentration than that of said semiconductor substrate, said second region being formed in said major surface of said semiconductor substrate spaced from said first region for a predetermined distance, and a third region of said second conductivity type formed adjacent to said second region so as to completely surround said second region except a channel region formed immediately below said second region, said third region having a portion exposed at said major surface of said semiconductor substrate and said channel region having an area smaller than that of the pn junction formed between said second and third semiconductor region,

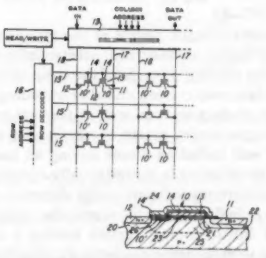
wherein a current path extending from said first region to said second region includes a thyristor structure by way of said third region and a diode structure by way of said channel region, and said current flowing mainly in parallel with said major surface.

4,258,378

ELECTRICALLY ALTERABLE FLOATING GATE MEMORY WITH SELF-ALIGNED LOW-THRESHOLD SERIES ENHANCEMENT TRANSISTOR

Lawrence S. Wall, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 26, 1978, Ser. No. 909,902
Int. Cl.[3] H01L *27/02*
U.S. Cl. 357—41 11 Claims



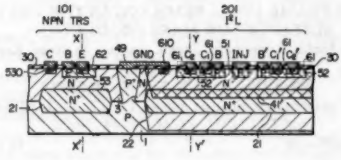
1. An electrically programmable, nonvolatile, floating gate, semiconductor memory array comprising: a plurality of cells arranged in an array of rows and columns; each cell in the array having a first MOS transistor device with a source, a drain, a floating gate, and a control gate, each first transistor device having a first threshold voltage when programmed at one logic level and a second higher threshold when programmed at another logic level; each cell in the array having a second MOS transistor device, the second MOS transistor in each cell having a source which is integral with the drain of the first MOS transistor device in such cell and a gate which is connected to the control gate of the first MOS transistor device in such cell, each second MOS transistor device having a drain, each second MOS transistor device having an impurity concentration in a channel under its gate which differs from the impurity concentration in a channel under said floating gate whereby the second MOS transistor exhibits a threshold substantially lower than said first threshold voltage; means for connecting the control gates of all of the first MOS transistor devices in each row together to provide row lines; means connecting said sources of all of the first MOS transistor devices in each of the columns separately to first column lines; means connecting said drains of all of the second MOS transistor devices in each of the columns separately to second column lines; programming means including means for selecting one of the row lines and applying a high voltage to it while applying a low voltage to the remaining row lines, and means for selectively connecting the first and second column lines to low voltage or high voltage supplies.

4,258,379

IIL WITH IN AND OUTDIFFUSED EMITTER POCKET

Tomoyuki Watanabe, Kodaira; Takahiro Okabe, Hinodemachi; Minoru Nagata, Kodaira; Tohru Nakamura, Hoya; Kenji Kaneko, Hachioji; Yutaka Okada, Kokubunji; Norio Anzai, Tokorozawa; Takanori Nishimura, Mitaka, and Takashi Agatsuma, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 24, 1979, Ser. No. 78,452
Claims priority, application Japan, Sep. 25, 1978, 53-130299
Int. Cl.[3] H01L *27/04;* H03K *19/091*
U.S. Cl. 357—44 14 Claims



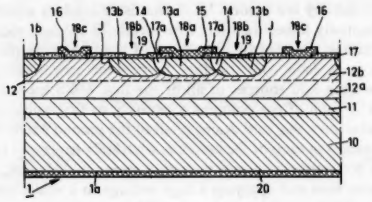
1. A semiconductor IC device in which a semiconductor layer formed on a semiconductor substrate of a first type conductivity and having a second type impurity concentration higher than the non-dope concentration thereof, is divided into plural island regions by an isolation region of insulating material or semiconductor having said first type conductivity and an integrated injection logic (IIL) circuit is formed in a first one of said plural island regions, wherein a well region is formed from the surface of said first island region down, said well region having said second type conductivity and an impurity concentration higher than that of said semiconductor layer; an up-diffused region is formed from the bottom of said first island region up, said up-diffused region having said second type conductivity and an impurity concentration higher than that of said semiconductor layer; and a buried layer is formed near the bottom of said island region, said buried region having said second type conductivity and an impurity concentration higher than that of said up-diffused region.

4,258,380

BIPOLAR TRANSISTOR HAVING AN INTEGRATED RESISTIVE EMITTER ZONE

Bernard P. Roger, Carpiquet, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1979, Ser. No. 12,188
Claims priority, application France, Feb. 21, 1978, 78 04856
Int. Cl.³ H01L *27/02*
U.S. Cl. 357—51 **7 Claims**



1. A bipolar transistor, which comprises:

a semiconductor body having a major surface;

a surface-adjoining base region of a first conductivity type having a conductive base contact at its surface;

a surface-adjoining emitter region of a second conductivity type opposite to that of the first and located in said base region, said emitter region being surrounded by said base region and forming a p-n junction therewith, and said emitter region having a conductive emitter contact at its surface; and

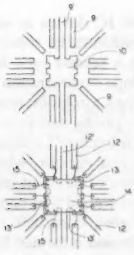
an integrated resistive emitter zone of closed geometric configuration within said emitter region and extending from the surface of said emitter region to said junction to divide said emitter region into first and second sub-regions, said first sub-region being located within said closed geometric configuration and connected to said conductive emitter contact and said second sub-region being located outside said closed geometric region and between said first sub-region and said conductive base contact.

4,258,381

LEAD FRAME FOR A SEMICONDUCTOR DEVICE SUITABLE FOR MASS PRODUCTION

Kiyoharu Inaba, Kumamoto, Japan, assignor to Steag, Kernergie GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 6, 1978, Ser. No. 966,861
Claims priority, application Japan, Dec. 7, 1977, 52/147662
Int. Cl.³ H01L *23/48, 29/44, 29/52*
U.S. Cl. 357—70 **15 Claims**



1. A lead frame for a semiconductor device comprising:

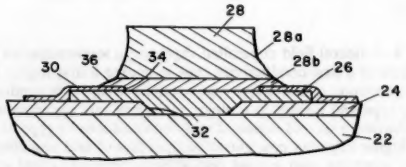
a planar island portion adapted to carry a semiconductor chip thereon and having recesses and protrusions formed to extend outwardly in the plane of the island and along the contours of its peripheral side portions, and a plurality of leads spaced apart from said island portion and extending outwardly from the neighborhood of said island portion, top edges of said leads facing and being generally parallel to the protrusions between said recesses of said island portion.

4,258,382

EXPANDED PAD STRUCTURE

James M. Harris, Palo Alto, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 3, 1978, Ser. No. 921,493
Int. Cl.³ H01L *23/48*
U.S. Cl. 357—71 **8 Claims**



1. A bump pad structure for electrical connections comprising in combination:

1 a pad comprising a structure of conductive metal having a predetermined lateral dimension mounted on and connected to a portion of a conductive chip, at least a portion of said pad overlying a layer of oxide on said chip;

a passive protection layer overlying a portion of the edges of the pad;

and a bump of conductive metal mounted on said pad and having a base portion having a lateral dimension less than the predetermined lateral dimension of the pad and located on the pad so that no portion of the bump overlaps an edge of the pad.

4,258,383

MINIMUM PRESSURE DROP LIQUID COOLED STRUCTURE FOR A SEMICONDUCTOR DEVICE

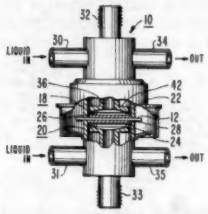
Sebastian W. Kessler, Jr., Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

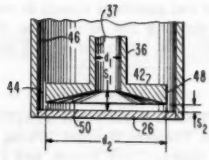
Filed Dec. 22, 1978, Ser. No. 972,406
Int. Cl.³ H01L *25/04, 23/48*
U.S. Cl. 357—82 **2 Claims**

1. A semiconductor device of the type comprising a semiconductor wafer, at least one substantially circular cooling chamber for cooling one side of the semiconductor wafer by a liquid coolant, said cooling chamber including a relatively thin thermally conductive base wall in thermal contact with said semiconductor wafer, means to supply said liquid coolant to said base wall including a tube having an inner diameter, d_1, said tube terminating in a substantially circular flange portion having a frustro-conical surface for directing the coolant substantially radially outwardly across the entire base wall surface, said frustro-conical surface having a smaller diameter coincident with the inner diameter, d_1, of said tube and a larger diameter, d_2, substantially coincident with the periphery of said flange portion, said flange portion being disposed within said chamber in relatively close proximity to said base wall so that the spacing, s_1, between the base wall and the frustro-conical surface of said flange at the tube inner diameter, d_1, and the spacing, s_2, between the base wall and the frustro-conical

surface of said flange at the diameter, d_2, conform substantially with the expression

$$d_2/d_1 = s_1/s_2$$





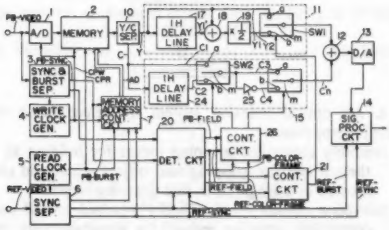
thereby providing the minimum pressure drop in said liquid coolant.

4,258,384

COLOR VIDEO SIGNAL PROCESSING SYSTEM

Mitsushige Tatami, Ebina, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 27, 1979, Ser. No. 97,781
Claims priority, application Japan, Nov. 30, 1978, 53-148416
Int. Cl.³ H04N *5/92, 9/499*
U.S. Cl. 358—16 **12 Claims**



1. Signal processing apparatus for a PAL color video signal reproduced from a video signal playback apparatus comprising:

playback color field signal generating means for generating a playback color field identification signal representative of a signal sequence of the reproduced PAL color video signal;

reference color field signal generating means for generating a reference color field identification signal having a standard signal sequence of a PAL color video signal;

luminance-chrominance separating means for separating luminance and chrominance signal components out of said reproduced PAL color video signal;

luminance signal correcting means for correcting a vertical shift of a reproduced image on a monitor screen;

chrominance signal correcting means for correcting a signal phase sequence of the chrominance signal components in compliance with a standard signal phase sequence of the PAL color video signal;

control signal generating means for generating a luminance control signal and a chrominance control signal by comparing said playback color field identification signal with said reference color field identification signal; and

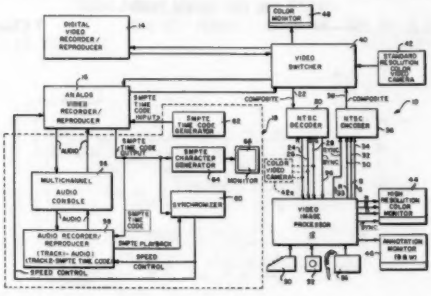
control means for controlling said luminance signal correcting means and said chrominance signal correcting means in response to said luminance control signal and said chrominance control signal, respectively.

4,258,385

INTERACTIVE VIDEO PRODUCTION SYSTEM AND METHOD

George A. Greenberg, Los Angeles, and Wayne Duncan, Beverly Hills, both of Calif., assignors to Combined Logic Company, Beverly Hills, Calif.

Filed May 15, 1979, Ser. No. 39,184
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—22 **36 Claims**



1. An interactive video production system comprising an analog video storage means capable of retrievably storing a composite analog color video signal, said composite analog color video signal having red, blue and green analog video components and having an associated video information content, said analog video storage means being capable of retrievably providing said composite analog color video signal as a video output signal at a real time video frame rate; decoding means operatively connected to said analog video storage means for receiving said retrievably provided composite analog color video signal and for decoding said composite signal into said red, blue, and green analog video components each having said associated video information content, said decoding means being capable of providing said decoded red, blue and green analog video components as separate red, blue and green analog video output signals at said real time video frame rate; real time video image processing means operatively connected to said decoding means for receiving said provided separate red, blue and green analog video output of signals at said video frame rate, said video image processing means comprising means for digitizing said provided separate red, blue and green analog video output signals and for digitally processing each of said digitized red, blue and green analog video output signals at said video frame rate in a 4:3 aspect ratio configuration of active pixels defining a picture image area of active picture elements; real time interactive means operatively connected to said video image processing means for enabling real time interactive controllable digital processing of said associated video information content of each of said digitized red, blue and green analog video output signals on an active pixel-by-pixel basis within said picture image area by said video

image processing means, said real time interactive controllable digital processing being at said video frame rate, said video image processing means further comprising means for providing corresponding red, blue and green analog video output signals from said interactively controllably digitally processed red, blue and green video output signals, each of said video output signals solely containing said 4:3 aspect ratio of active pixels defining a picture image area; and encoding means operatively connected to said video image processing means for receiving said corresponding red, blue and green analog video output signals and for providing a broadcast compatible composite interactively processed analog color video signal therefrom, said provided composite color video signal solely containing said 4:3 aspect ratio configuration of active pixels defining a picture image area; whereby the video characteristics of each of the active pixels forming each video frame may be interactively controlled during video production at the video frame rate.

4,258,386

TELEVISION AUDIENCE MEASURING SYSTEM

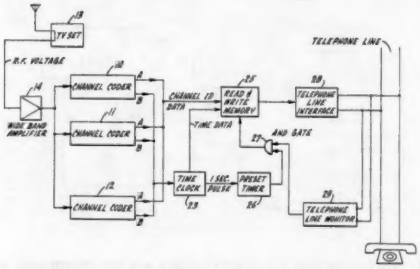
Shiu H. Cheung, 95B Robinson Rd., Hong Kong, Hong Kong

Filed Oct. 30, 1978, Ser. No. 955,802

Claims priority, application United Kingdom, Jul. 31, 1978, 31747/78

Int. Cl.³ H04N 7/00

U.S. Cl. 358—84 **7 Claims**



1. Apparatus for television audience analysis comprising means for monitoring a television receiver, said monitoring means comprising a plurality of bandpass filters connectable to a television receiver, each of said filters having a bandwidth selected for passing a signal representative of a specific channel of the receiver, means responsive to a monitored signal for storing information representative of channel identification and of the time at which a channel is selected and at which the selection of a channel is terminated, and means for reading the stored information periodically.

4,258,387

VIDEO TELEPHONE

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840, and Christian Grund, 2035 Burr Ave., Bronx, N.Y. 10461

Filed Oct. 17, 1979, Ser. No. 85,461

Int. Cl.³ H04N 7/12, 7/14

U.S. Cl. 358—85 **14 Claims**

1. Video-audio communication apparatus comprising in combination:

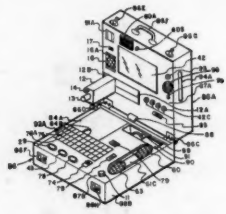
a housing,

first means supported by said housing for receiving and predeterminately positioning a telephone mouth-ear piece containing a microphone and speaker,

microphone and speaker means supported adjacent said first means and located to be respectively acoustically coupled to the speaker and microphone of the telephone mouth-earpiece when predeterminately located and supported by said first means,

a television camera secured to and supported by said housing and directed to scan and generate picture signals of an area adjacent said housing.

means for initiating and effecting automatic control of the read means of said television camera and generating a video picture signal on the output of said camera and



means for applying said video picture signal to said speaker means supported adjacent said first means whereby said speaker means is modulated by said video picture signal and generates sounds in the vicinity of the microphone defining the mouthpiece of the telephone mouth-earpiece unit supported by said first means.

4,258,388

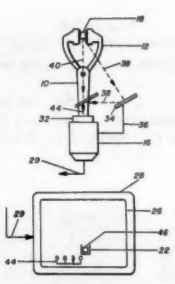
OPTICAL INDEXING SYSTEM

Irving H. Weisman, Flanders; Bernard Strauss, Rockaway, both of N.J.; David George, Park Forest, and Harold Wakeley, Winnebago, both of Ill., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 2, 1979, Ser. No. 8,675

Int. Cl.³ H04N 7/18

U.S. Cl. 358—100 **9 Claims**



1. An optical indexing system for teleoperator locating which comprises:

remotely controlled grasping means for holding an object therein and for grasping said object when said object is located at a set point in said grasping means;

television camera means, fixedly attached to said remotely controlled grasping means, for simultaneously viewing said object in three dimensions;

first mirror means operatively disposed and fixedly positioned in front of said television camera means for transmitting light from said object to said television camera means through a plurality of light paths;

second mirror means operatively disposed fixedly attached to said camera means with respect to said first mirror means for reflecting light from said object to said first mirror means, which includes;

a fully reflective single plane surface mirror; and

video monitor means electrically coupled to an output of said television camera means for displaying images transmitted by said first and second mirror means to said camera means, said video monitor means showing two sepa-

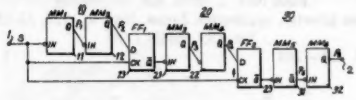
rate images of said object when said object is not located at said set point of said grasping means and showing a single image of said object when said object is located at said set point.

4,258,389

CIRCUIT FOR FORMING A VERTICAL SYNCHRONIZING SIGNAL

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 23, 1979, Ser. No. 5,794
Claims priority, application Japan, Feb. 3, 1978, 53-10528
Int. Cl.³ H04N 5/08
U.S. Cl. 358—154 **7 Claims**



1. A circuit for forming a vertical synchronizing signal from a composite synchronizing pulse signal separated from a composite video signal, the composite synchronizing pulse signal being formed of an equalizing pulse portion positioned at the end of a field of the composite video signal and having a plurality of equalizing pulses each of a width approximately one-half the width of horizontal synchronizing signals occurring in the composite video signal and successive ones of said equalizing pulses being separated by an interval approximately one-half the interval between successive ones of said horizontal synchronizing signals, the circuit comprising:

means for discriminating between said equalizing pulses and said horizontal synchronizing signals on the basis of the respective widths thereof and providing an output indicating the presence of at least one such equalizing pulse; and

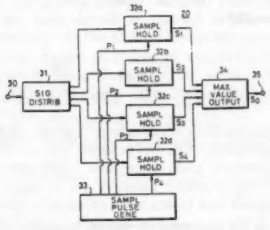
means for generating a single corresponding vertical synchronizing signal at the end of a field in response to the output of said means for discriminating.

4,258,390

VIDEO SIGNAL PROCESSING CIRCUIT

Hideshi Tanaka, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 17, 1978, Ser. No. 934,487
Claims priority, application Japan, Aug. 19, 1977, 52/99342
Int. Cl.³ H04N 5/14
U.S. Cl. 358—160 **11 Claims**



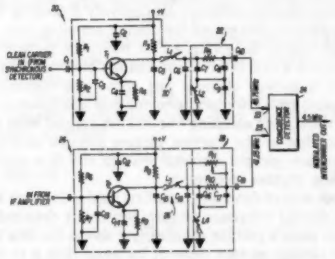
1. A video signal processing circuit comprising: sampling pulse generating means for generating a plurality of pulse trains respectively having sampling pulses of a pulse width τ and a period T, said sampling pulses of respective pulse trains having different phases from each other so as not to overlap on a time axis; a plurality of sampling hold circuits, each of which is responsive to the sampling pulses of its corresponding pulse train and samples a common video signal supplied thereto and holds the sampled signal until the succeeding sampling pulse of the corresponding pulse train is applied thereto; maximum or minimum value output circuit means for deriving the maximum or minimum level from among the instantaneous output signals of the plurality of sampling hold circuits; subtraction circuit means for subtracting the video signal and the output signal of said maximum or minimum value output circuit means for each other; and means for clipping the output signal of said subtraction circuit means at a predetermined level to produce a binary video signal.

4,258,391

SOUND INTERCARRIER DETECTOR

Joseph M. Papay, Kitchener, Canada, assignor to Pay Television Corporation, Manhasset, N.Y.

Filed Jul. 31, 1979, Ser. No. 62,527
Int. Cl.³ H04N 5/62
U.S. Cl. 358—197 **3 Claims**



1. In combination with a television receiver having sound and video intermediate frequency signals, a video intermediate frequency amplifier, and a video synchronous detector, a circuit comprising:

(A) an intercarrier sound detector, having first and second inputs;

(B) a first amplifier having output and input, said input being coupled to the oscillator output of the video synchronous detector;

(C) a second amplifier having output and input, said input being coupled to an output of the video intermediate frequency amplifier;

(D) a first output circuit, coupling the output of said first amplifier to the first input of the intercarrier sound detector, said first output circuit including

(D_1) a first impedance matching network for tuning said first amplifier to the video intermediate frequency and

(D_2) a sound intermediate frequency trap interposed between said first impedance matching network and said intercarrier sound detector;

(E) a second output circuit coupling the output of said second amplifier to the second input of the intercarrier sound detector, including:

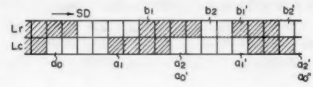
(E_1) a second impedance matching network for tuning said second amplifier to the sound intermediate frequency and

(E_2) a video intermediate frequency trap interposed between said second impedance matching network and said intercarrier sound detector.

4,258,392
CODING METHOD FOR FACSIMILE SIGNAL

Yasuhiro Yamazaki, Hiratsuka; Yasushi Wakahara, Tokyo; Kiyohiro Yuuki, and Toyomichi Yamada, both of Yokosuka, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, and Nippon Telegraph and Telephone Public Corporation, both of Tokyo, Japan

Filed Nov. 19, 1979, Ser. No. 95,927
Claims priority, application Japan, Nov. 22, 1978, 53-144594; Jan. 24, 1979, 54-6030
Int. Cl.[3] H04N *1/40, 7/12*
U.S. Cl. 358—260 8 Claims



1. A coding method for a facsimile signal, in which a two-level facsimile signal obtained by scanning an original picture and successively sampling the scanning output into picture elements is received as an input, and in which the position of an information change picture element having changed from one to the other of two signal levels is coded and outputted, the improvement of the method comprising:

a first step of setting a starting picture element on a coding scanning line to be coded from which the coding starts;

a second step of detecting first and second information change picture elements successively following the starting picture element on the coding scanning line;

a third step of detecting a first reference picture element which is a first information change picture element lying after a picture element just above the starting picture element on a reference scanning line immediately preceding the coding scanning line and has a signal level different from that of the starting picture element and a second reference picture element next to the first information change picture element;

a fourth step of detecting, as a first mode, the state in which the second reference picture element is detected spaced apart from a picture element just above the first information change picture element by more than n (n being an integer) picture elements;

a fifth step of detecting, as not the first mode, the state in which the second reference picture element is not detected spaced apart from a picture element just above the first information change picture element by more than n picture elements;

a sixth step of comparing a first correlation between the starting picture element and the first information change picture element and between the first information change picture element and the second information change picture element with a second correlation between the first information change picture element and the first reference picture element and between the second information change picture element and the second reference picture element when the abovesaid state is detected as not the first mode;

a seventh step of coding the prsence of the first and second reference picture elements as the first mode and setting the picture element just below the second reference picture element as the starting picture element in the first step when the first mode is detected;

an eighth step of coding a distance between the starting picture element and the first information change picture element and a distance betweenn the first information change picture element and the second information change picture element as a second mode and setting the second information change picture element as the starting picture element in the first step when the first correlation is higher than the second correlation;

a ninth step of coding a distance between the first information change picture element and the first reference picture element and a distance between the second information change picture element and the second reference picture element is a third mode and setting the second information change picture element as the starting picture element in the first step when the first correlation is lower than the second correlation; and

a tenth step of sending out the coded outputs of the seventh, eighth and ninth steps after combining them into a composite signal.

4,258,393
PICTURE PROCESSING METHOD

Kouichi Ejiri, Chiba, and Keiji Sekigawa, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 1, 1979, Ser. No. 90,110
Claims priority, application Japan, Nov. 6, 1978, 53-136435
Int. Cl.[3] H04N *1/40*
U.S. Cl. 358—283 1 Claim

1. A picture element processing method, in which a picture element S(i,j) to be processed is divided into four smaller picture elements $S_1(i,j)$ through $S_4(i,j)$, the density of each of said smaller picture elements $S_1(i,j)$ through $S_4(i,j)$ is determined from the algebraic mean value of the densities of said picture element S(i,j) and picture elements surrounding said picture element, and each smaller picture element $S_m(i,j)$ (m=1, 2, 3 and 4) is determined by a DITHER MATRIX T(k,l) as $S_m(i,j)=1$ when $S_m(i,j) \geqq T(k,l)$ and $S_m(i,j)=0$ when $S_m(i,j)<T(k,l)$ where, using Gauss' notation,

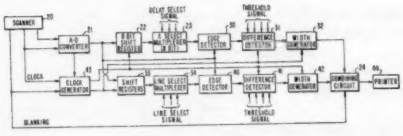
$$k=i-4[(i-1)/4] \text{ and}$$

$$l=j-4[(j-1)/4].$$

4,258,394
DIGITAL CIRCUIT FOR ACCURATELY DETECTING CHANGES IN THE GRAY SCALE OF A SCANNED IMAGE

Paul G. Kennedy, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 26, 1977, Ser. No. 828,057
Int. Cl.[3] H04M *1/40*
U.S. Cl. 358—284 8 Claims



1. A system for scanning an image to detect changes in the gray scale of the image being scanned, comprising:

(a) a scanner for scanning said image to produce a plurality of lines of video information, said plurality of lines of video information comprising a video signal representing said image being scanned;

(b) delay means for delaying said video signal by a predetermined amount to produce a first delayed video signal;

(c) means for comparing the amplitude of said video signal to the amplitude of said first delayed video signal and for generating a plurality of pulses with a pulse being gener-

ated each time the absolute value of the difference between these signals exceeds a predetermined value;

(d) storage means for storing a predetermined number of said pulses;

(e) circuit means for examining the pattern of said stored pulses to generate a signal indicative of the central portion of the change in gray scale represented by said stored pulses.

4,258,395

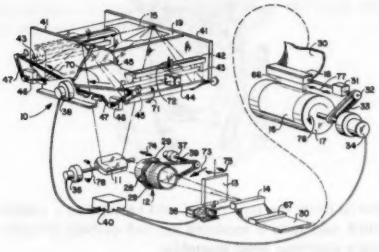
DOCUMENT SCANNING SYSTEM

Eugene Nodov, Richardson, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 12, 1979, Ser. No. 75,052

Int. Cl.³ H04N *1/10*

U.S. Cl. 358—293 **7 Claims**



1. A document scanning system comprising:

flat bed document support means for supporting a document to be copied,

illumination means for creating an elongated beam of illuminating light and directing said beam of light toward said document support means to create an illuminated strip extending in a first direction across said document,

an illumination scanner for causing said beam of illumination to move cyclically across said document in a second direction perpendicular to said first direction,

imaging means for observing at least that portion of said document including said strip and projecting an image of the strip upon an image plane,

an image scanner operating in sychronism with said first scanning means and arcuately controlling the viewing angle of said imaging means so that the light reflected from said strip is directed toward an imaging window within said image plane,

image detecting means positioned within said imaging window and comprising planar array of photodetectors for sensing the light levels at spaced positions extending across substantially the full extent of said image,

field flattening means operable in synchronism with said image scanner for maintaining the image plane of said imaging means coincident with the plane of said photodetectors, and

image shifting means operable in synchronism with said image scanner for causing overall relative lateral movement between said image and said photodetectors in a amount equal to the distance between said spaced positions during a plurality of scans of said image scanner.

4,258,396

DOCUMENT ILLUMINATION APPARATUS

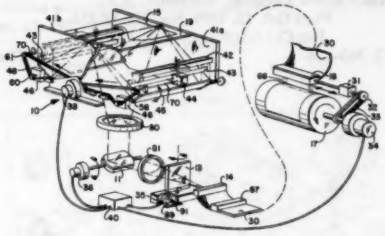
Burton W. Scott, Plano, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 12, 1979, Ser. No. 75,297

Int. Cl.³ H04N *1/04*

U.S. Cl. 358—293 **1 Claim**

1. Document illumination apparatus comprising means for supporting a document, a line source of illumination for illuminating said document, beam forming means for forming the illumination from said line source into an elongated beam, scanning means for scanning said beam across said document, and a pair of reflective surfaces positioned perpendicular to



said line source and extending substantially the full length of the transmission path of said beam from said line source to said document for intercepting sidewardly directed illumination and redirecting it laterally inward toward said document.

4,258,397

AUTOMATIC RECORDING LEVEL CONTROLLING CIRCUIT

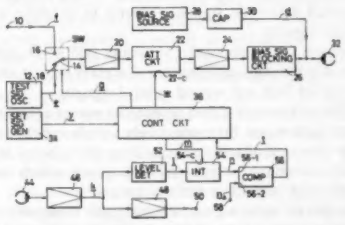
Masatsugu Kitamura; Hideo Onoye, and Masami Yamazaki, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed May 23, 1979, Ser. No. 41,821

Claims priority, application Japan, May 28, 1978, 53-63608; Jul. 19, 1978, 53-87100

Int. Cl.³ G11B *27/36, 5/02*

U.S. Cl. 360—31 **19 Claims**



1. An automatic recording level controlling circuit for a magnetic recording device, comprising:

(a) an audio test signal generator;

(b) a switching circuit for selectively passing to a recording head one of an input audio signal and said audio test signal;

(c) a variable loss attenuation circuit responsive to the output signal of said switching circuit and coupled to said recording head, the output signal of said variable loss attenuation circuit being recorded on a magnetic medium via said recording head;

(d) first means responsive to a signal reproduced from said magnetic medium for detecting the level of the reproduced signal corresponding to said audio test signal; and

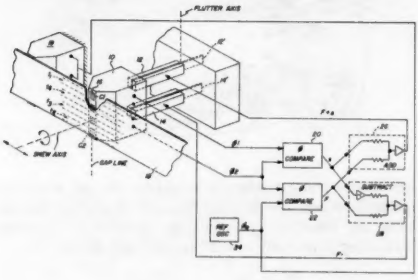
(e) second means for producing a control signal in accordance with the output signal of said first means, the attenuation factor of said variable loss attenuation circuit being so adjusted by said control signal that the level of said reproduced signal is as close to a reference level as possible.

4,258,398

APPARATUS FOR PREVENTING FLUTTER AND SKEW IN ELECTRICAL SIGNALS

James A. Bixby, San Diego; Charles E. Wright, Escondido, and GilbertE. Kammerer, Del Mar, all of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 12, 1979, Ser. No. 84,233
Int. Cl.³ G11B *5/43, 21/02, 21/24*
U.S. Cl. 360—76 **10 Claims**



1. Apparatus for reproducing time-coherent information signals recorded in respective tracks of a plurality of tracks of a recording medium, at least two tracks of the plurality having recorded therein time-coherent reference signals having the same nominal phase, comprising:

(a) playback means having a linear array of signal transducers respectively cooperating with said tracks for producing signals recorded therein;

(b) a reference signal source for producing a signal having said nominal phase;

(c) means cooperative with said playback means for comparing the phases of the played-back recorded reference signals and for phase-comparing the signal output of the reference signal source with one of said played-back recorded reference signals, thereby to produce a pair of error signals;

(d) means for algebraically summing said error signals and for algebraically differencing said error signals, thereby to produce first and second control signals;

(e) first and second signal-responsive means coupled to said playback means for respectively translating that means in the direction of said tracks, said coupling being at spaced-apart locations of said playback means which are crosswise with respect to said tracks; and

(f) means for applying said error signals respectively to said first and second signal-responsive means, whereby simultaneously occurring error signals of like and different polarity cause respectively flutter cancelling positioning of said playback means along said tracks and skew cancelling rotation of said playback means about an axis thereof.

4,258,399

MAGNETIC RECORDING AND REPRODUCING APPARATUS

Kazunori Iijima; Kazuo Honma, both of Ibaraki; Takao Terayama, Kashiwa; Masashi Yoshida, Nakaminato; Hideyuki Kawase, Katsuta, and Seii Miyakawa, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 31, 1979, Ser. No. 7,974
Claims priority, application Japan, Feb. 15, 1978, 53-15418; Jun. 14, 1978, 53-70909
Int. Cl.³ G11B *15/66, 17/00*
U.S. Cl. 360—85 **13 Claims**

1. An apparatus for recording and reproducing signals on and from a magnetic tape contained in a tape cassette mounted in a cassette receiving section thereof, the apparatus comprising:

a base plate;

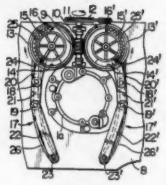
a guide board disposed above said base plate;

a rotary magnetic head assembly mounted on said base plate and including rotary magnetic heads for recording and reproducing signals on and from a magnetic tape mounted on said assembly;

said cassette receiving section being located forwardly of said rotary magnetic head assembly;

said guide board defining therein guide slots extending generally rearwardly from said cassette receiving section;

a pair of tape drawing and mounting means operative to engage with a magnetic tape in a cassette mounted in said cassette receiving section, said tape drawing and mounting means being movable respectively along said guide



slots to draw the tape out of said cassette to a position in which said tape is mounted on and extends around said rotary magnetic head assembly;

means for stopping the movements of said tape drawing and mounting means at positions located substantially on the opposite sides of said rotary magnetic head assembly;

chains disposed between said guide board and said base plate

means for winding and unwinding said chains;

each of said chains comprising a plurality of link members pivotally connected to each other by pins, each chain having respective ends connected to said chain winding and unwinding means and to said tape drawing and mounting means; and

guide members mounted on said base plate and extending substantially rearwardly on the opposite sides of said rotary magnetic head assembly for guiding the pins of said chains.

4,258,400

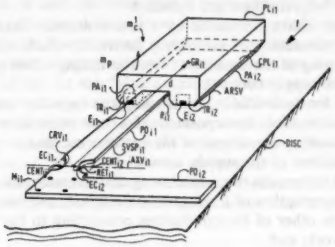
PLATFORM HAVING AT LEAST ONE TRANSDUCER FOR READING FROM AND/OR RECORDING ON A DATA CARRIER

Jean-Pierre Lazzari, Paris, France, assignor to Compagnie Internationale pour l'Informatique Cii/Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 30, 1979, Ser. No. 34,747
Claims priority, application France, Jun. 21, 1978, 78 18576
Int. Cl.³ G11B *5/60, 17/32*
U.S. Cl. 360—103 **11 Claims**

1. A platform supporting at least one transducer for reading from and/or recording on a data carrier, wherein the data carrier moves relative to the platform and the platform during transducing is spaced from the data carrier by resulting air bearing pressure, comprising a main body having an upper and a lower face and containing the transducer, a suspension means including at least one rigid strut connected on one end to the said body and adapted to be connected at the other end to a carrier arm for positioning the transducer over the data carrier, said transducer having means for reading and/or recording data, said transducer being disposed in the lower face of said body facing the said carrier, and means for balancing the sum of the moments of the forces applied to the platform about the axis of oscillation of the platform such that said forces are zero, said means for balancing comprising a constriction in the strut

at which the cross-sectional area of the strut is at a minimum, the constriction having an axis of symmetry in a direction



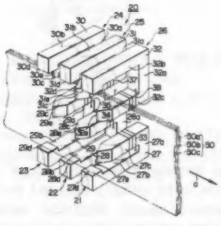
perpendicular to the major dimension of the strut coinciding with the said axis of oscillation.

4,258,401

MULTI-CHANNEL RECORD/PLAYBACK MAGNETIC HEAD

Masahide Yoshida, and Takashi Kodama, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1979, Ser. No. 34,564
Claims priority, application Japan, May 29, 1978, 53-64015
Int. Cl.³ G11B *5/12*
U.S. Cl. 360—125 **7 Claims**



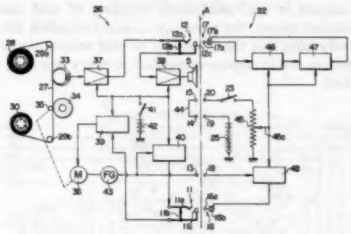
1. A multi-channel record/playback magnetic head for use with a magnetic tape recording medium including a high permeability layer carrying a film base on one side thereof and carrying a top layer on the opposite side thereof which has an easy axis of magnetization in the direction of thickness thereof; the head comprising a plurality of magnetic head elements, each of the elements including a magnetic head core, each core including a magnetic record/playback pole which is adapted to be disposed opposite to the surface of the top layer and at least one flux conducting pole separate from said record/playback pole adapted to be disposed opposite to at least one lateral end face of the recording medium, the plurality of magnetic head elements being adapted to be arranged with their individual record/playback poles located opposite to areas of the recording medium which are mutually different crosswise thereof so that said record/playback poles are staggered relative to each other and relative to said recording medium.

4,258,402

SMALL SIZE TAPE RECORDER WITH ADAPTER

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,564
Claims priority, application Japan, Nov. 21, 1977, 52/140530; Nov. 21, 1977, 52/140531
Int. Cl.³ G11B *5/00, 15/12*
U.S. Cl. 360—137 **6 Claims**



1. A compact tape recorder apparatus having tape drive means, playback means for playing back information recorded in a tape and a first portable power supply especially designed for energizing only said tape drive means and said means for playing back information recorded on a tape;

an adapter;

first joining means on said tape recorder apparatus for receiving said adapter;

second joining means on said adapter for coupling with said first joining means;

recorder coupling means on said tape recorder apparatus for accepting said adapter to control an operation of said compact recorder apparatus, said coupling means including a plurality of recorder terminal means;

said adapter including controlling means for adjustably controlling the operating speed of said compact tape recorder apparatus tape drive means, said adapter also including a second portable power supply especially adapted for providing power to said adapter controlling means and a plurality of adapter terminal means for connecting to said plurality of recorder terminal means when said adapter is connected to said tape recorder apparatus, said adapter terminal means and said recorder terminal means electrically connecting said controlling means to said tape drive means and said playback means when said first and second joining means are coupled together;

said controlling means further including speech control circuit means for compressing or expanding the time axis of the playback information to correct for the speed adjustment provided by said controlling means; and

said first and second power supplies being respectively housed in said recorder apparatus and said adapter and independently supplying power to their associated playback means and controlling means and having different voltage ratings, said first power supply being a low voltage, high capacity portable power source and said second power supply being a high voltage, low capacity portable power source.

4,258,403

GROUND FAULT CIRCUIT INTERRUPTER

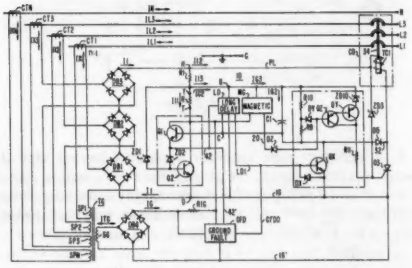
Alan B. Shimp, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 31, 1979, Ser. No. 44,150
Int. Cl.³ H02H *3/08*
U.S. Cl. 361—42 **9 Claims**

1. A circuit interrupter of the type having separable main contacts which open and close on a conductor in an electrical system, comprising:

current transformer means for providing a secondary winding current thereof which controls the operation of said separable mean contacts as a function of the primary winding current thereof which flows in said conductor;

summing transformer means the primary winding of which is connected in circuit relationship with the secondary winding of said current transformer means for utilizing said secondary winding current for determining the presence of ground fault current in said electrical system, the voltage drop across said primary winding of said summing transformer means contributing to the presence of excitation current in said secondary winding of said current transformer means, the presence of said excitation current adversely affecting the accuracy of said secondary winding current for in representing said primary winding current; and



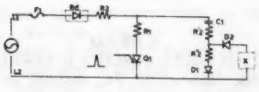
control means connected to the secondary winding of said summing transformer means for providing an output signal whenever said ground fault current exceeds a predetermined level, said control means requiring a minimum value of secondary winding voltage for accurate operation thereof, the turns ratio of said summing transformer means being sufficiently high to provide said minimum value of secondary winding voltage from a value of primary winding voltage of said summing transformer means which is sufficiently low as to produce a value of excitation current which is insignificant when compared with said current transformer means secondary winding current to thus reduce the inaccuracy caused by said excitation current.

4,258,404

FAIL-SAFE CONTROL CIRCUIT, PARTICULARLY FOR HEATING APPARATUS

Jacques Challet, Chambarel-Ceaux D'Allegre, France, assignor to Constructions Electriques R.V., Le Puy, France

Filed May 8, 1979, Ser. No. 36,978
Claims priority, application France, May 16, 1978, 78 14437
Int. Cl.³ H02H *3/08*
U.S. Cl. 361—156 **6 Claims**



1. A fail-safe control circuit, capable of transferring the electrical energy of a supply network as Ac voltage to an external load, of the type comprising a capacitor-reservoir charged periodically by the supply circuit and discharged similarly into the load by means of a controlled conduction member, wherein there are included:

rectifier means connected by a low resistance circuit to a first conductor of the supply network, which effect the charging of the capacitor-reservoir during a first polarity of the supply network;

means for controllably discharging the capacitor-reservoir into the load, incorporated in a low resistance circuit connecting the output of the rectifier means to a second conductor of the supply network;

at least one means of protection against overcurrents, acting by interruption of its electric conduction, inserted in one or the other of the conductors connecting to the supply network; and

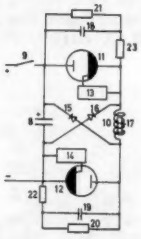
means for controlling the controlled discharge means of the capacitor-reservoir causing said discharge during the second polarity of the supply network in response to an external excitation; said circuit being furthermore arranged in order to produce, if there occurs a false energizing of the controlled discharge means of the capacitor-reservoir during the first polarity of the supply network, an overcurrent whose amplitude is independent of the load and for causing the interruption of the operation by the action of the protection means against excess currents.

4,258,405

ELECTRICAL IMPULSE GENERATOR

Erich A. Steingroever, Flensburger Strasse 33, 53 Bonn, Fed. Rep. of Germany

Filed Feb. 16, 1979, Ser. No. 12,804
Int. Cl.³ H01H *47/30*
U.S. Cl. 361—156 **11 Claims**



1. Electrical impulse generating circuit means comprising capacitor means to be initially charged from a direct current source, inductance means, electrical switching means and polarity reversing means, said switching means and polarity reversing means being connected between the capacitor means and inductance means to fully energize said inductance means by discharge of said capacitor means when the switching means is conductive and to at least partially charge the capacitor means by undamped deenergizing of the inductance means when the switching means is non-conductive, the polarity of the inductance means and capacitor means being unchanged at all times.

4,258,406

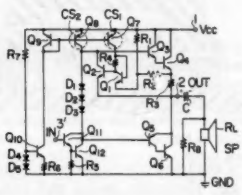
PROTECTING CIRCUIT

Kunio Seki, Hinode, Japan, assignor to Hitachi, Ltd., Japan

Filed Jun. 26, 1979, Ser. No. 52,208
Claims priority, application Japan, Jul. 7, 1978, 53-81903
Int. Cl.³ H02H *7/20*
U.S. Cl. 361—79 **6 Claims**

1. In a protecting circuit comprising; means connected across the collector and emitter of a transistor that is to be

protected thereby to detect a voltage across the collector and emitter of said transistor that is to be protected, current-detecting means connected in series with the collector-emitter current path of said transistor that is to be protected thereby to detect a collector current or an emitter current of said transistor that is to be protected, a detector transistor that will be driven with voltage produced by said two means, a constant-current circuit for supplying a constant current to said detector transistor, and a control transistor of which the base is driven by the collector output of said detector transistor thereby to directly or indirectly control the base of the transistor that is to be protected, the improvement characterized in that a first resistor and a second resistor are connected in series between the collector and emitter of said transistor that is to be protected thereby to constitute said means for detecting the voltage between said collector and emitter, an end of a third resistor that serves as said current detecting means is connected to the collector or the emitter of said transistor that is to be protected, other end of said third resistor is connected to the emitter of said control transistor, a connection point between said first resistor and said second resistor is connected to the emitter of said detector transistor, a fourth resistor is connected across the collector and base of said detector transistor, one end of said fourth resistor connected to the base of said detector transistor is connected to said constant-current circuit, and other end of said fourth resistor connected to the collector of said detector transistor is connected to the base of said control transistor.

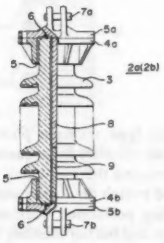


4,258,407

LIGHTNING ARRESTER DEVICE FOR POWER TRANSMISSION LINE

Nobuo Nagai, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1979, Ser. No. 21,174
Claims priority, application Japan, Mar. 18, 1978, 53-31462
Int. Cl.³ H02H 3/22
U.S. Cl. 361—117 **5 Claims**



1. A lightning arrester device for use with a power transmission line, comprising:

a lightning arrester including a linear resistor and a non-linear resistor connected in series; and

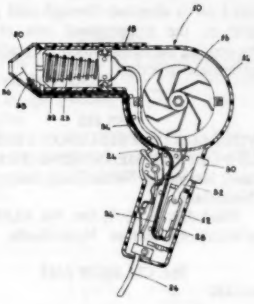
a pair of electrodes, one of said electrodes being disposed at each end of said lightning arrester, said electrodes forming a gap therebetween.

4,258,408

DEVICE FOR NEUTRALIZING ELECTROSTATIC CHARGES

Paolo Cantelli, Bologna, Italy, assignor to Fiap S.r.l., Bologna, Italy

Filed May 16, 1979, Ser. No. 39,594
Claims priority, application Italy, May 22, 1978, 53341/78[U]
Int. Cl.³ H05F 3/06
U.S. Cl. 361—213 **5 Claims**



1. A device for neutralizing electrostatic charges comprising:

a ducted electric fan connected to an electric supply circuit;

at least one electric generator for alternatively producing electric charges of opposite sign, said at least one electrical generator being constituted by at least one piezo-electric transducer and being connected to an operating push-button which can be operated manually or by a petal;

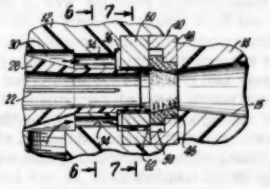
at least one metal electrode connected electrically to said at least one piezo-electric transducer and placed along a path followed by flow of air exiting from the device and generated by said electric fan.

4,258,409

ELECTROGASDYNAMIC COATING APPARATUS

Donald H. Porter, Ocean County, N.J., assignor to Estey Dynamics Corporation, Red Bank, N.J.

Filed Mar. 8, 1979, Ser. No. 18,794
Int. Cl.³ B05B 5/00
U.S. Cl. 361—227 **6 Claims**



1. An electrogasdynamic apparatus for applying a coating to an article comprising:

a longitudinally extending nonconductive conduit for conveying a stream of coating particles from an upstream reservoir and for directing the coating particles downstream towards the article to be coated;

a source of coating particles in communication with said nonconductive conduit;

a source of pressurized air in communication with said non-

conductive conduit for carrying said coating particles towards the article to be coated;

a conductive needle axially positioned within said conduit;

an annular conductive attractor member disposed ajdacent said needle for forming a corona discharge area between said attractor member and said conductive needle for ionizing the coating particles passing therethrough, said attractor member having a radially inner porous portion and a radially outer nonporous portion, and wherein said nonporous portion includes an annular channel disposed on the upstream side of said attractor member and in communication with said porous portion; and

means for channeling a portion of said pressurized air to said annular channel of said attractor member such that said pressurized air is directed through said porous portion, transverse to the longitudinal axis of said conduit, whereby coating particles which may adhere to said porous portion are dislodged.

4,258,410

HIGH VOLTAGE DISTRIBUTION SYSTEM WITH MOVABLE VOLTAGE MEASURING TRANSFORMER

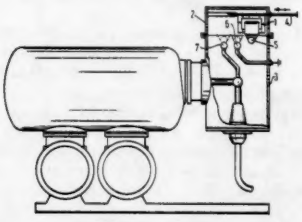
Rintje Boersma, Harmelen, Netherlands, assignor to Coq B.V., Utrecht, Netherlands

Filed Aug. 6, 1979, Ser. No. 63,817

Claims priority, application Netherlands, Sep. 4, 1978, 7809048

Int. Cl.³ H02B *1/18*

U.S. Cl. 361—332 **6 Claims**



1. In a high voltage electrical power distribution system which comprises an earthed metal envelope system with a dielectric gas, sealed therein at least one high voltage conductor housed within said envelope system and protected, in use, from high voltage arcing to said envelope system by the dielectric gas, and a voltage measuring transformer also housed within said system and normally connected with said conductor to measure the voltage impressed thereon, the improvement wherein said conductor is provided with a fixed contact and said transformer is provided with a contact normally engaging said fixed contact whereby to allow the aforesaid voltage measurement, mounting means mounting said transformer for movement within said envelope system to engage and disengage said contact of the transformer with said fixed contact, and means disposed exteriorally of said envelope system for moving said transformer within the envelope system while maintaining the gas sealed therein, whereby to allow dielectric testing of the distribution system without imposing test voltage on the transformer.

4,258,411

ELECTRONIC DEVICE PACKAGING ARRANGEMENT

Charles J. Sherman, Westminster, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N. J. 07974

Filed May 21, 1979, Ser. No. 40,648

Int. Cl.³ H05K *7/20*

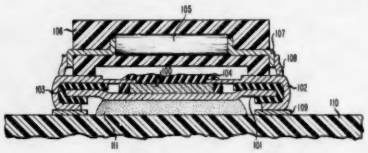
U.S. Cl. 361—386 **5 Claims**

1. A circuit assemblage which thermally and electrically connects an electronic device to a printed circuit board comprising:

thermally conductive base means having a depression in the top thereof and a protuberance in the bottom thereof corresponding to said depression in the top;

wherein said electronic device is mounted in said depression for providing a thermally conductive path between said electronic device and said base means;

wherein said protuberance of said base means is connected to a matching location on said printed circuit board, providing a thermally conductive path between said electronic device and said printed circuit board;



a plurality of electrical conductor means ohmically attached to both said electronic device and conductors on said printed circuit board, electrically connecting said electronic device to said printed circuit board conductors; and

wherein said plurality of electrical conductor means extend from said electronic device along the top surface of said base means and around the edge of said base means and along the bottom surface of said base means where said electrical conductor means are connected to said printed circuit board conductors.

4,258,412

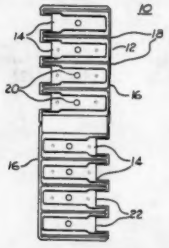
FLASH LAMP ARRAY HAVING IMPROVED REFLECTOR AND BARRIER MEMBER

James M. Hanson, Euclid; Juliana Pinkasovich, S. Euclid, and Vaughn C. Sterling, Cleveland Heights, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 23, 1979, Ser. No. 41,934

Int. Cl.³ G03B *15/02*

U.S. Cl. 362—10 **9 Claims**

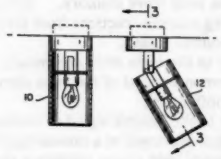


1. In a planar type multiple photoflash array utilizing a circuit board with circuitry for sequentially firing a plurality of flash lamps connected thereto which further includes radiiant energy activated switch devices in said circuitry and with said flash lamps being positioned horizontallly in cavities of an integral reflector and barrier member supported on said circuit board by the surface having said circuitry, the improvement which comprises further including spacer means between the contacting surfaces of said circuit board and barrier member to reduce the amount of radiant energy being transmitted by the flash lamps to the radiant energy activated switch devices on the underlying circuit board.

4,258,413
TELESCOPING, TILTABLE LIGHT FIXTURE

Victor Mausser, 59-34 Madison St., Ridgewood, N.Y. 11227

Filed Sep. 4, 1979, Ser. No. 72,110
Int. Cl.[3] F21V 21/00
U.S. Cl. 362—287 2 Claims

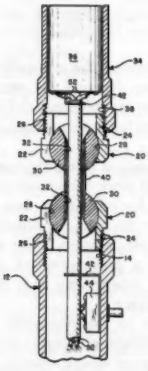


1. A telescopic, tiltable light fixture, comprising in combination a housing adapted to be secured to an electrical outlet box, mounting means for the fixture extending downwardly of said housing, a lamp socket, a lamp socket holder secured to said lamp socket and slidable along said mounting means, electrical contact means in said mounting means and in said lamp holder for conducting electrical current to said lamp socket, a shade secured to said socket, said mounting means comprising a pair of spaced downwardly extending members, said lamp holder having a longitudinal through slot, a pivot pin extending through said pair of downwardly extending members and through said lamp socket holder, said members being formed with longitudinal channels having arcuate end portion and lined with insulating material liners, brass contact strips in said liners, respectively, wire pigtails secured to the ends of said brass strips for connecting to an electrical power source, said lamp socket holder including said contact means cooperating with said brass contact strips and electrically connected to said lamp socket.

4,258,414
UNIVERSAL TROUBLE LIGHT

Louis Sokol, Rockville Centre, N.Y., assignor to Plymouth Products Incorporated, Oceanside, N.Y.

Filed Aug. 1, 1979, Ser. No. 62,583
Int. Cl.[3] F21V 21/29, 21/08, 15/02
U.S. Cl. 362—421 8 Claims

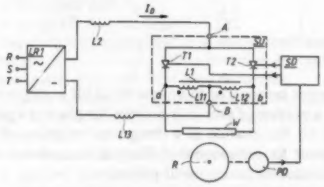


1. A universal trouble light comprising:
a longitudinally extending handle;
a first ball element having a through aperture formed therein and a socket for said ball element adapted to rotatably retain same and be carried by said handle at one end thereof;
a longitudinally extending barrel member;
a second ball element having a through aperture formed therein and a socket for said second ball element adapted to rotatably retain same and be carried by said barrel member at one end thereof;
a hollow sleeve member rigidly connecting said first and second ball elements to thereby position said one ends of said handle and barrel member in spaced proximity to each other permitting relative rotative and angular movement therebetween;
an electrical receptacle positioned floatingly within said barrel member;
and electrical conductor elements extending through the apertures in said ball elements and through said sleeve connecting said receptacle with a source of electrical supply.

4,258,415
APPARATUS FOR SUPPLYING CURRENT OF CHANGING POLARITY TO A LOAD OBJECT

Vilmos Török, Lidingö, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Jan. 19, 1979, Ser. No. 4,787
Claims priority, application Sweden, Jan. 27, 1978, 7801010
Int. Cl.[3] H02M 7/00
U.S. Cl. 363—64 10 Claims



1. An improved current supply apparatus of a type wherein first and second power connectors are connected to a DC current source for supplying an essentially load-independent current having a changing polarity to at least one load object which is capable of supplying reactive power, the improvement comprising:
at least two branch means connected in parallel between said first and second power connectors, each of said branch means having a series connected switching means, tap means and winding means for directing the flow of said driving current in a direction defined by said switching means, said switching means being a load-commutated thyristor,
interphase transformer inductor means for holding and magnetically coupling each of the winding means; and means for connecting said at least one load object between at least a tap means of one of said at least two branch means and a tap means of another of said at least two branch means.

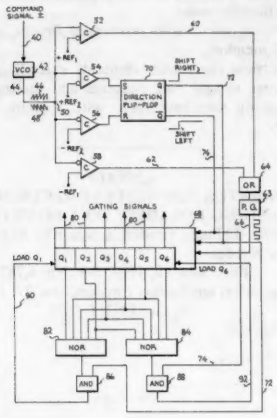
4,258,416
INVERTER POWER CONVERSION SYSTEM HAVING IMPROVED CONTROL SCHEME

Loren H. Walker, Salem, and John H. Cutler, Roanoke, both of Va., assignors to General Electric Company, Salem, Va.

Filed Apr. 24, 1979, Ser. No. 32,895
Int. Cl.[3] H02M 7/515, 7/757
U.S. Cl. 363—137 15 Claims

1. In a polyphase inverter system for converting direct current electrical power to alternating current electrical power through the use of conduction controlled devices selectively rendered operable in response to gating signals applied thereto, the improvement comprising:
(a) pulse generator means for producing a train of pulses at a frequency proportional to the desired operational frequency of said inverter system;

(b) a nonrecirculating shift register having a plurality of bit positions, said shift register providing output signals serving to initiate said gating signals in accordance with the instantaneous states of each of the bit positions of said shift register, said shift register being responsive to said train of pulses to shift the contents thereof; and,



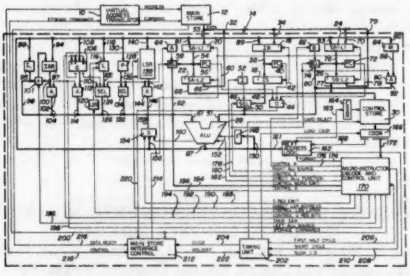
(c) logic means responsive to a prescribed bit configuration extant in a portion of said shift register for placing a predetermined bit designation in a designated position of said shift register for subsequent shifting in accordance with the occurrence of said train of pulses.

4,258,417

SYSTEM FOR INTERFACING BETWEEN MAIN STORE MEMORY AND A CENTRAL PROCESSOR

Neil C. Berglund, Kasson, and David A. Luick, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1978, Ser. No. 954,067
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—200 **48 Claims**



1. Apparatus for interfacing a main store memory operating at a first rate with a central processor operating at a second rate, the central processor including a control store memory having a collection of microinstructions which are selectively accessed and decoded for execution, the main store memory receiving commands and addresses from the central processor and providing a response signal to the central processor at the completion of the command, comprising:

an interface register connected to the main store memory and to the central processor to receive data from either and transfer data to the central processor,

a data register connected to the interface register and the main store memory to receive data from the interface register and transfer data to the main store memory,

means for decoding microinstructions from the control store memory into main store commands for control of the operation of the main store memory,

means for decoding microinstructions from the control store memory into control signals,

means responsive to the main store commands, control signals, and the response signal of the main store memory to generate a holdoff signal,

means responsive to the holdoff signal to control the operation of the central processor at a rate compatible with the main store memory, said means inhibiting the subsequent execution of microinstructions from integral or non-integral numbers of cycles of the central processor to prevent use or alteration of the contents of the interface or data register, and

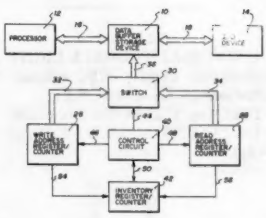
means responsive to main store commands, the main store response, and control signals to control the transfer of data from the interface register to the data register to permit overlap operation between main store memory and operation of the central processor.

4,258,418

VARIABLE CAPACITY DATA BUFFER SYSTEM

Chester A. Heath, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1978, Ser. No. 973,938
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—200 **17 Claims**



1. A data buffer system for controlling the transfer of data between a processor, wherein the processor generates command signals, and an input/output (I/O) device comprising:

data storage means having a maximum data storage capacity value;

said data storage means being disposed between the processor and the I/O device for receiving data input from the processor and for outputting data to the I/O device to thereby transfer dta from the processor to the I/O device;

said data storage means temporarily storing within said data storage means a predetermined amount of data while simultaneously transferring data between the processor and the I/O device;

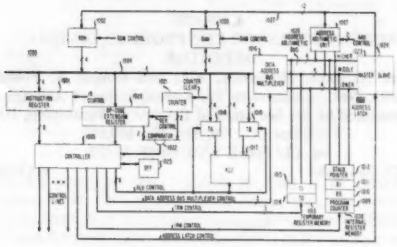
means responsive to the processor command signals for selectively establishing a threshold storage capacity value of said data storage means wherein said threshold storage capacity value is less than said maximum data storage capacity value; and

means interconnected to said data storage means for maintaining said predetermined amount of data temporarily stored in said data storage means equal to said threshold storage capacity value while said data storage means receives data from the processor and outputs data to the I/O device.

4,258,419
DATA PROCESSING APPARATUS PROVIDING VARIABLE OPERAND WIDTH OPERATION

Donald E. Blahut, Holmdel; David H. Copp, Morristown, and Daniel C. Stanzione, Marlboro, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1978, Ser. No. 974,425
Int. Cl.³ G06F 9/34
U.S. Cl. 364—200 3 Claims



1. A CPU of a data processing system designed for executing a program of stored instructions, the CPU being adapted to be coupled to memory means having a multiplicity of addressable storage locations containing instructions and data, each instruction having an op-code portion and an address portion, the data including N-bit operand words and op-code extension words, the CPU comprising:

(a) instruction register means for storing an instruction;

(b) instruction retrieval means for transferring a current instruction from the memory means to the instruction register means in each instruction cycle;

(c) an op-code extension register for storing an op-code extension word;

(d) control means responsive to the combination of the op-code portion of the current instruction and the contents of the op-code extension register for generating control signals corresponding to processor operations specified by the combination;

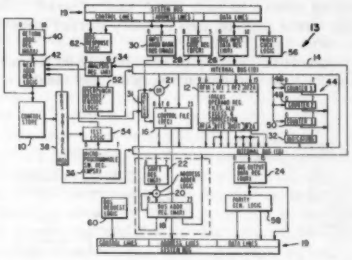
(e) arithmetic logic mens responsive to certain ones of the control signals for performing arithmetic or logic operations on one or more operands specified by the address portion of the current instruction, each operand for an arithmetic or logic operation being formed with one or more N-bit operand words, the number of N-bit operand words forming an operand being specified by the contents of designated bit positions of the op-code extension register, the arithmetic logic means being adapted to operate separately on each N-bit word of an operand in sequence according to the order of significance of the N-bit words and beginning with the least significant N-bit word; and

(f) data retrieval means responsive to particular control signals from the control means and to the address portion of the current instruction for transferring specified operands from the memory means to the arithmetic logic means when the current instruction specifies an arithmetical or logic operation and for transferring a specified op-code extension word from the memory means to the op-code extension register when the current instruction is a special instruction for transferring a newly selected op-code extension word from the memory means to the op-code extension register.

4,258,420
CONTROL FILE APPARATUS FOR A DATA PROCESSING SYSTEM

Virendra S. Negi, Pepperell, and Arthur Peters, Sudbury, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 3, 1979, Ser. No. 733
Int. Cl.³ G06F 9/38
U.S. Cl. 364—200 11 Claims



1. A data processing system comprising:

A. a first data processor;

B. a second data processor;

C. means for coupling said first and second data processors for the receipt of data and instructions by said second data processor from said first data processor;

D. a main memory for storing information, said main memory being connected to said first and second data processors; and

E. said second data processor comprising

1. control store means, having a plurality of commands stored therein, operative to control the operation of said second data processor,

2. means for storing a function code included in a said instruction received by said second data processor,

3. a control file comprising a plurality of locations for storing said data received from said first data processor,

4. first address means for addressing a location in said control file with either a said command from said control store or a said function code received by said means for storing from said first data processor, and

5. second address means for addressing said main memory with the contents of the location addressed by said first address means.

4,258,421
VEHICLE MONITORING AND RECORDING SYSTEM

John E. Juhasz, Lake Orion, and Hansel O. Williams, Troy, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 881,221, Feb. 27, 1978, abandoned. This application Mar. 14, 1979, Ser. No. 20,622
Int. Cl.³ G06F 13/00; G08B 23/00
U.S. Cl. 364—424 13 Claims

1. A vehicle parameter monitoring, recording and analyzing system comprising:

(a) a plurality of sensors positioned for sensing operating parameters of said vehicle and for generating data signals corresponding to values of said operating parameters in response thereto;

(b) a data processing and recording device positioned onboard said vehicle and comprising:

(i) computing means including a central processing unit (CPU) for processing said data signals;

(ii) program memory storage means for storing an operating program for said CPU;

(iii) said CPU operating in accordance with said operating program to compare said operating parameter values to

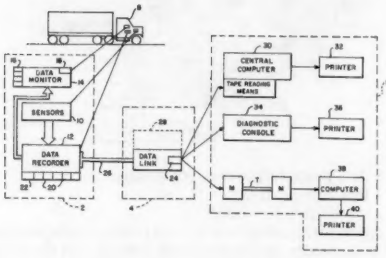
predetermined threshold values corresponding to each operating parameter and to select said operating parameter values which exceed their respective threshold values for processing same in accordance with predetermined criteria as stored in said program memory storage means;

(iv) data memory storage means for receiving and storing data representations corresponding to said selected and processed operating parameter values from said CPU; and

(c) power supply means associated with said vehicle for providing power to said CPU, said program memory storage means and said data memory storage means;

(d) a portable data link comprising:

(i) a non-volatile memory of substantially larger memory capacity than said data memory storage means;



(ii) power generating means, independent of said vehicle, for operating said non-volatile memory;

(iii) means for connecting said non-volatile memory to said data memory storage means;

(iv) means for reading the selected, processed and stored data representations from said data memory storage means into said non-volatile memory; and

(v) means for disconnecting said non-volatile memory from said data storage memory means;

(e) a remote computing apparatus comprising:

(i) means for reading said selected, processed and stored data representations from said non-volatile memory;

(ii) means for analyzing said selected, processed and stored data representations; and

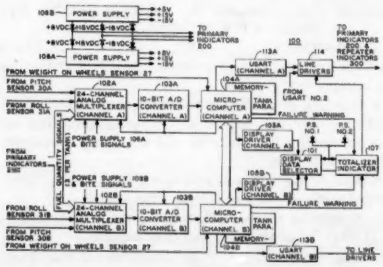
(iii) means for printing said analyzed data representations.

4,258,422

LIQUID GAGING SYSTEM

William R. Dougherty, St. Anthony; Martin J. van Dyke, Brooklyn Park, and Dwight D. Colby, Roseville, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 4, 1979, Ser. No. 36,119
Int. Cl.[3] G01F *23/26*
U.S. Cl. 364—442 **32 Claims**



1. A liquid gaging system, comprising:

a probe for mounting in a tank, the probe having a length, the probe for a particular tank producing a length signal dependent upon the portion of the probe being immersed in liquid;

means for receiving an attitude signal related to an attitude of the tank;

storage means for storing data related to tank shape, volume, and attitude and to probe location; and

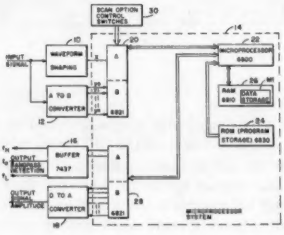
determining means for determining a value related to a liquid quantity in the particular tank based on the length signal, the attitude signal, and the data, the determining means being connected to the probe, the means for receiving, and the storage means.

4,258,423

MICROPROCESSOR CONTROLLED DIGITAL DETECTOR

Richard A. Lane, Huntsville, Ala., and Donald K. Fronek, Sparks, Nev., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 5, 1979, Ser. No. 100,685
Int. Cl.[3] H03K *9/06*; G06F *15/20*
U.S. Cl. 364—484 **6 Claims**



1. A microprocessor controlled digital detector for detecting the presence of selected frequencies in an input signal comprising: a microprocessor system having a plurality of inputs and outputs, a waveform shaping circuit having an input adapted to receive an input frequency signal and an output coupled to said microprocessor system, an analog-to-digital converter having an input coupled to receive said input frequency signal and an output coupled to said microprocessor system, a buffer coupled to receive an output from said microprocessor system and having an output indicative of the bandpass of said input signal, and a digital-to-analog converter having an input coupled to an output of said microprocessor system and having an output indicative of the amplitude of said input signal.

4,258,424

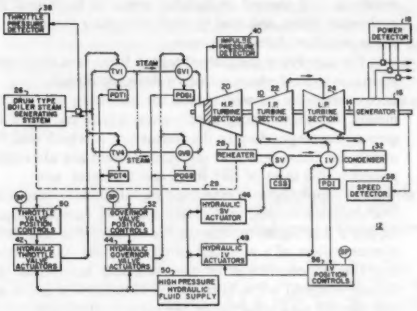
SYSTEM AND METHOD FOR OPERATING A STEAM TURBINE AND AN ELECTRIC POWER GENERATING PLANT

Theodore C. Giras, Forest Hills, and Manfred E. Birnbaum, Philadelphia, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 319,115, Dec. 29, 1972, abandoned, which is a continuation of Ser. No. 124,993, Mar. 16, 1971, abandoned, which is a continuation of Ser. No. 722,779, Apr. 19, 1968, abandoned. This application Sep. 7, 1976, Ser. No. 720,725
Int. Cl.[3] G06F *15/46*; F01B *25/00*
U.S. Cl. 364—494 **68 Claims**

1. A system for operating a steam turbine comprising nonlinear operating steam valve means for determining the flow of steam through at least one section of the turbine, means for determining a representation of the actual value of at least one variable turbine condition selected from the turbine speed condition and the turbine load condition, programmed digital computer means having a reference representation of said one

turbine condition, said computer system further having means for generating at least one predetermined linearizing characterization to offset the nonlinear relationship of valve position to steam flow, said digital computer means having means for



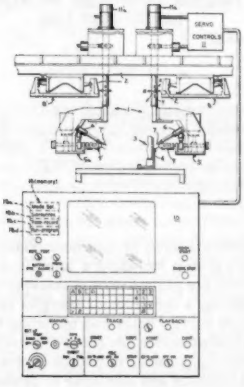
generating position control signals for said valve means in accordance with the reference representation and the linearizing characterization and the actual condition representation, and means for controlling said valve means in accordance with the determined position control signals.

4,258,425

SELF-PROGRAMMED MECHANICAL WORKING APPARATUS

Paul W. Ramsey, Milwaukee, and John G. Bollinger, Madison, both of Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Mar. 8, 1979, Ser. No. 18,662
Int. Cl.³ G05B *19/42*
U.S. Cl. 364—513 **29 Claims**



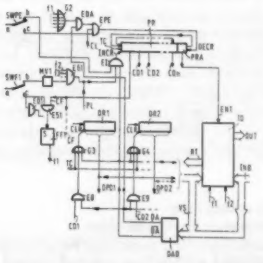
1. An automatic mechanical working apparatus having a first means mounted for multi-dimensional movement relative to a second means within a defined work area for following a geometric curve in space having at least one portion with a progressively changing slope and having means to support said second means within the apparatus with a curved work path corresponding to said geometric curve and said second means being adapted to be worked on by said first means during relative movement between said first and second means, comprising a tracer means coupled to the first means for corresponding progressive and continuous movement along said work path and producing an output signal during such movement, a computer means connected to said tracer means and having sampling and digitizing means for developing input signals as said tracer means moves through said work path, said computer means including a program memory including a drive program including coordinate definition for direction of movement of the first means at a plurality of point locations with respect to said path including a start location and a finish location of said curved work path in space within the work area of said apparatus and a plurality of spaced point coordinate location between said start and finish locations, said memory including a self-programming dynamic trace-record program means responsive to said input signals of the moving tracer means to cause said tracer means to follow said path with the tracer means located in engagement with the work path and having means to record position related curve fitting data of the moving tracer means for each coordinate definition at said spaced point coordinate locations to thereby generate coordinate curve fitting data for each of said point coordinate locations and having means to convert said coordinate curve fitting data into a curve essentially corresponding to said curved work path, and storing said coordinate data in a tool control program memory for recreating such curve in the absence of said tracer means, said program memory including a run program means in which said tool control program memory is read and said first means is moved relative to the second means in accordance with said defined curve for subsequent working said second means along said curved path.

4,258,426

DEVICE FOR SELECTING VALUES OF DATA ELEMENTS

Giovanni Balzarini, Lesto Calende, and Roberto Papeschi, Milan, both of Italy, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1979, Ser. No. 5,938
Claims priority, application Italy, Jan. 27, 1978, 19708 A/78
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—518 **4 Claims**



1. Device for selecting values of data elements forming part of a group of data elements, said group of data elements including at least two different types of data elements, each type having one or more data elements, comprising:

an operation means;

the operation means, dependent upon the time said means is operated, causing the selection of a value of a data element;

display means;

first register means adapted for registering and delivering to said display means, selectable values of data elements of the said different types of data elements;

second register means for registering and delivering to said first register means and to said display means indication information controlling which one of the data elements out of the group of data elements is subject to value selection by said operation means, and predetermined indication information for data elements of the different types of data elements the values of which are to be selected subsequently;

third register means to alter said indication information on a repeated operation of the operation means so that subsequent data elements out of the group of data elements are prepared for value selection;

muliplexing means for allowing selection of values of data elements of a second type usable in connection with the data elements of first type;

by which multiplexing means, for each selected value of a data element of said first type, said first and second register means being repeatedly used on the subsequent repeated operation of said operation means for selecting said values of data elements of the second type;

fourth means connected to the first register means for detecting whether values of data elements of at least one type of data elements have been selected;

if not, said fourth means placing the indication information at and controlling the alteration thereof from a first side of the second register means, incrementing from the most significant data element of said type;

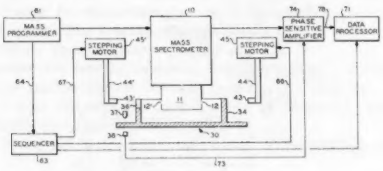
if yes, said fourth means preparing to place and on a command from a further operation means placing the indication information at and, on continued operation of said further operation means, controlling the alteration thereof from the other side of the second register means, decrementing from the least significant data element, erasing subsequent values of earlier selected data elements from the first register and the display means and after which command the erased values of the data elements being reselectable.

4,258,427

ISOTOPE ANALYSIS

John A. Favre, and Thomas W. Schmidt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 18, 1979, Ser. No. 30,988
Int. Cl.³ H01J *39/34*
U.S. Cl. 364—527 **11 Claims**



1. Apparatus comprising:

a mass spectrometer having an inlet;

means for directing a first molecular beam formed from the vapor associated with a first material toward the inlet of said mass spectrometer at a time T;

means for directing a second molecular beam formed from the vapor associated with a second material toward the inlet of said mass spectrometer at said time T;

shutter means positioned so as to intersect said first molecular beam and said second molecular beam;

means for actuating said shutter means so that said first molecular beam and said second molecular beam are passed to the inlet of said mass spectrometer alternately;

first beam blocking means for blocking said first molecular beam;

means for moving said first beam blocking means into or out of the path of said first molecular beam;

second beam blocking means for blocking said second molecular beam;

means for moving said second beam blocking means into or out of the path of said second molecular beam;

means for initiating a sweep period for said mass spectrometer;

sequencer means;

means for initiating the operation of said sequencer means when a sweep period is initiated for said mass spectrometer, said sequencer means automatically controlling said means for moving said first beam blocking means and said means for moving said second beam blocking means so as to alternately pass or block either said first molecular beam or said second molecular beam or both said first molecular beam and said second molecular beam;

a phase sensitive detector means;

means for supplying the output signal from said mass spectrometer to said phase sensitive detector means;

means, responsive to said means for actuating said shutter means, for establishing a reference signal having a frequency corresponding to the frequency at which said first molecular beam and said molecular beam are alternately passed to the inlet of said mass spectrometer; and

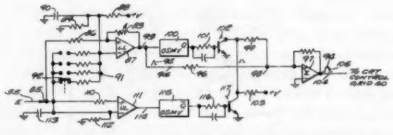
means for supplying said reference signal to said phase sensitive detector means, said phase sensitive detector means supply a first signal representative of the difference in the concentration of a selected isotope in said first material and the concentration of said selected isotope in said second material when both said first molecular beam and said second molecular beam are passed alternately to the inlet of said mass spectrometer, said phase sensitive detector means supplying a second signal representative of the concentration of said selected isotope in said first material when only said first molecular beam is being passed to the inlet of said mass spectrometer, said phase sensitive detector means supplying a third signal representative of the concentration of said selected isotope in said second material when said first molecular beam is blocked and only said second molecular beam is being passed to the inlet of said mass spectrometer.

4,258,428

COMPTON EFFECT DEEMPHASIZER FOR GAMMA CAMERAS

Eric M. Woronowicz, West Allis, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 25, 1979, Ser. No. 52,040
Int. Cl.³ G01T *1/20*
U.S. Cl. 364—527 **7 Claims**



1. A Compton scattered photon deemphasizer device for a gamma camera system including a scintillator which scintillates where there are gamma photon absorption events caused by photons having a spectrum of energies residing between lower and upper energy limits and including energies indicative of some photons having lost energy by having experienced Compton scattering, an array of photodetectors optically coupled to said scintillator and operative to produce electric signals, respectively, having values depending on the physical relation of the photodetector to an event and on the energy of the event, means for summing said signals and for producing a total energy signal proportional to the total energy of an event, means for producing coordinate signals corresponding with the coordinates of said events in the scintillator, cathode ray tube display means having a screen and including means controlled by said coordinate signals to determine corresponding coordinates of respective events on said screen, said tube including a control electrode to which z pulses are applied for enabling said tube to display events on said screen,

said deemphasizer device having input means for receiving successive total energy signals and z pulse output means coupled with said cathode ray tube control electrode,

means in said deemphasizer device for determining the peak energy level of each total energy signal falling between said lower and upper limits of said spectrum,

means responsive to said peak level being determined by producing a z pulse proportional in amplitude to the energy level of the peak for peaks representative of energies greater than said lower energy limit and less than or equal to a predetermined higher energy level in the part of the spectrum where significant Compton scattered photons exist and by producing constant amplitude z pulses for the part of the spectrum falling between said predetermined level and said upper energy limit.

4,258,429

MULTIPHASE CLOCKING FOR MOS ELECTRONIC CALCULATOR OR DIGITAL PROCESSOR CHIP

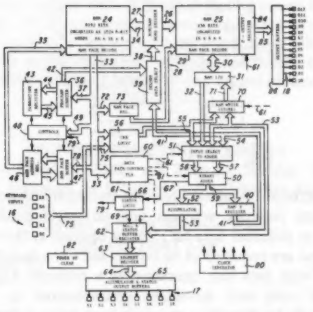
Joseph H. Raymond, Jr., Katy, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 713,062, Aug. 9, 1976, Pat. No. 4,037,090, which is a continuation of Ser. No. 525,246, Nov. 19, 1974, abandoned. This application Jul. 8, 1977, Ser. No. 813,916

The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.

Int. Cl.³ G06F *1/04, 7/38, 13/06*

U.S. Cl. 364—900 **1 Claim**



1. An electronic digital processor system implemented in a single MOS/LSI semiconductor body, comprising: data storage means including a random access memory in which multibit data words are accessed by first addressing means; program storage means accessed by second addressing means and including a read-only memory containing a large number of instruction words; arithmetic means for performing arithmetic and logic operations on input data words applied to inputs thereof; control means receiving the instruction words accessed from the read-only-memory and generating command signals; transfer means under control of command signals for applying parts of accessed instruction words or outputs of the arithmetic means to said first and second addressing means; means connecting command signals to selector means, said selector means having inputs coupled to the data storage means and outputs coupled to said inputs of the arithmetic means for transferring accessed data words from the data storage means to the arithmetic means under control of said command signals, said selector means further having inputs coupled to outputs of the arithmetic means, and having output means which may be coupled to the data storage means for transferring data words from said outputs of the arithmetic means to the data storage means under control of command signals; timing means for the system having a machine cycle during which both the random access memory and the read-only-memory are accessed and the control means receives an accessed instruction word and generates command signals after which the arithmetic means may receive an input via said selector means; the timing means including means defining multiple clock periods within each machine cycle, including a first clock interval during which the random access memory is accessed and a second clock interval during which the read-only-memory is accessed.

4,258,430

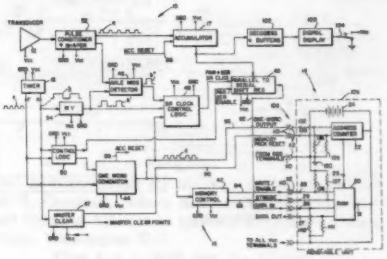
INFORMATION COLLECTION AND STORAGE SYSTEM WITH REMOVABLE MEMORY

Robert M. Tyburski, 4918 Briar St., Fairfax, Va. 22032

Continuation-in-part of Ser. No. 876,164, Feb. 8, 1978, abandoned. This application Dec. 8, 1978, Ser. No. 967,845

Int. Cl.³ G06F *13/00*; G08G *1/065*

U.S. Cl. 364—900 **46 Claims**



1. An information collection and storage system comprising first means for supplying a train of electrical pulses and for obtaining a pulse count that is a function of and determined by the number of said pulses, the number of said pulses being indicative of certain information, a data storage circuit, means providing for the detachable connection of said data storage circuit to said first means to enable said storage circuit to be selectively disconnected from said first means and removed from said information collection and storage system for transportation to a selected location, a volatile read/write memory means in said storage circuit for storing data in binary form, and at least one battery in said storage circuit, said battery being connected to said memory means to supply the power for preserving the data stored in said memory means both when said storage circuit is connected to said first means and removed from said system, said first means including circuit means connected to said memory means when said storage circuit is connected to said first means for writing into said memory data resulting from the pulse count obtained by said first means.

4,258,431

ELECTRONIC TIMEPIECE HAVING AN ANALOG DISPLAY DEVICE AND A DIGITAL DISPLAY DEVICE

Fukuo Sekiya, Tokorozawa, and Takashi Yamada, Sayama, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1978, Ser. No. 966,915

Claims priority, application Japan, Dec. 9, 1977, 52-147796; Feb. 16, 1978, 53-18780[U]

Int. Cl.³ G04C *9/00*

U.S. Cl. 368—188 **11 Claims**

1. An electronic timepiece having an analog display device and a digital display device, comprising:

a source of a standard frequency signal;

frequency divider means for dividing the frequency of said standard frequency signal to provide a low frequency signal and a standard time signal;

time counter circuit means responsive to said standard time signal for counting at least minutes and hours to provide output signals indicative of at least units of minutes digit, tens of minutes digit, units of hours digit, and tens of hours digit;

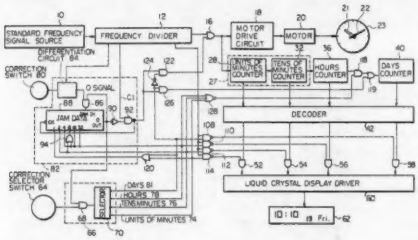
correction selector switch means;

selector circuit means coupled to said correction selector switch means and producing output signals for selecting

one of said digits, of said time counter circuit means, to be corrected;

correction switch means;

correction pulse generation circuit means coupled to said correction switch means and to said selector circuit means, whereby a single actuation of said correction switch means causes a number of correction pulses to be sequentially generated by said correction pulse generation circuit means and whereby the value of said number of correction pulses is determined by logic level potentials of said output signals of said selector circuit means;



said time counter circuit means being responsive to said correction pulses to update the content of said selected digit;

motor drive circuit means to receive said standard time signal and said correction pulses; and

a motor driven by said motor drive circuit means to actuate said analog display device;

said digital display device for displaying the contents of said time counter circuit means in digital form in response to said output signals from said time counter circuit means.

4,258,432

ELECTRO-ACOUSTIC DEVICE FOR ALARM WATCH

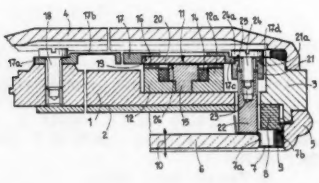
Roberto Zafferri, Lugano, and Laurent Grosjean, Neuchatel, both of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Oct. 25, 1979, Ser. No. 87,967

Claims priority, application Switzerland, Nov. 10, 1978, 11582/78

Int. Cl.³ G04C *21/16*

U.S. Cl. 368—250 **9 Claims**



1. An electro-acoustic device, particularly for use with an alarm watch movement, comprising:

a base;

solenoid means mounted on said base for creating an oscillating electromagnetic field;

a lever having a flexible first end mounted on said base, a second end opposite said first end, and a portion including magnetic material located for cooperating with said field and for providing said second end with an oscillating motion while said magnetic material is actuated by said field;

sound generating means for generating sounds; and

connecting means for rigidly connecting said second end of the lever and said sound generating means to transmit with fidelity the oscillations of the lever to the sound generating means.

4,258,433

DIGITAL DATA COMMUNICATION NETWORK HAVING DIFFERING DATA TRANSMISSION RATE CAPABILITIES

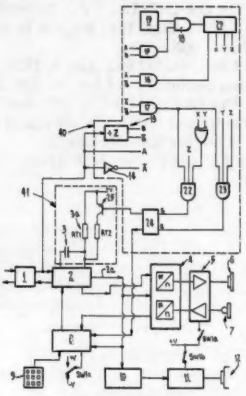
Ludwik Herschtal, North Balwyn, and Alfred Zelenka, Carlton, both of Australia, assignors to L M Ericsson Pty. Ltd., Broadmeadows, Australia

Filed Apr. 17, 1979, Ser. No. 30,758

Claims priority, application Australia, Apr. 28, 1978, PD4202

Int. Cl.³ H04L *5/14*

U.S. Cl. 370—24 **2 Claims**



1. A method for interconnecting two terminal devices in a digital data network wherein said terminals either operate normally at different data bit rates or operate at the same data bit rate and are required to be connected via a data link in the network, said data link operating at a reduced data bit rate compared with said terminals, characterized in that said method includes detecting at a switching point in the network when a first terminal has initiated a communication with a second terminal determining, by means of a processor at said switching point, whether said second terminal is adapted to normally operate at a different data bit rate to said first terminal and if said communication is via a data link in the network limited in operation to a data bit rate less than said normal bit rate of one or both said terminals, and sending a digital bit stream to one or both said terminals to cause said terminals to operate during said communication, at the lowest of the normal data bit rates of said terminals and said data link.

4,258,434

BIT-BY-BIT TIME-DIVISION DIGITAL SWITCHING NETWORK

Albert Glowinski, Impasse des Vignes, Clamart, France (92140), and Pierre M. Lucas, 20 Rue Henri Tariel, Issy-les-Moulineaux, France (92130)

Filed Jun. 18, 1979, Ser. No. 49,225

Claims priority, application France, Jun. 29, 1978, 78 19507

Int. Cl.³ H04Q *11/04*; H04J *6/00*

U.S. Cl. 370—60 **11 Claims**

1. A time-division digital switching network for switching a plurality of incoming and outgoing isochronous digital data channels having rates which are different but sub-multiples of a given low rate, said switching network comprising:

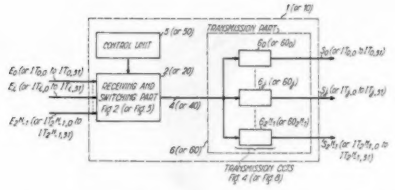
means for phasing said incoming digital channels;

means for detecting bits having a predetermined binary state from the phased incoming digital channels;

means for storing address words of said outgoing digital channels to be switched to said incoming digital channels;

means controlled by said predetermined by binary state bit detecting means for reading stored outgoing channel address words which correspond to switched incoming channels whose detected bits have said predetermined binary state;

means for multiplexing the read outgoing channel address words into an address word multiplex digital highway at high rate;



means interconnected to said multiplex digital highway and each outgoing digital channel for detecting said address words of said outgoing digital channel; and

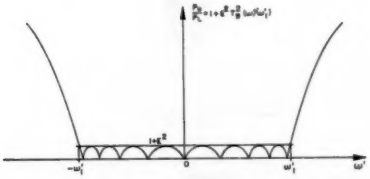
means associated with each outgoing digital channel and controlled by said address word detecting means for transmitting a bit at said predetermined binary state or a bit in the other binary state on said outgoing digital channel in response to the respective detection or failure to detect said address word of said outgoing digital channel.

4,258,435

MANIFOLD MULTIPLEXERS

Ralph Levy, Newton, Mass., and John D. Rhodes, Guiseley, England, assignors to Microwave Development Labs. Inc., Needham, Mass.

Filed Jan. 8, 1979, Ser. No. 1,480
Int. Cl.[3] H04J 1/08
U.S. Cl. 370—72 **6 Claims**



1. Electromagnetic signal multiplexer comprising;

a plurality of bandpass filters based upon a doubly-terminated prototype having different but adjacent frequency bands and each having at least one filter section, an energy coupling manifold means, and means coupling the bandpass filters to the manifold means at predetermined spaced locations therealong, including means for providing a phase shift of the manifold signal between spaced bandpass filters whereby additional immittance compensation is unnecessary, the phase shift being sufficient to match the manifold, the spacing of the filters being defined by the following equation:

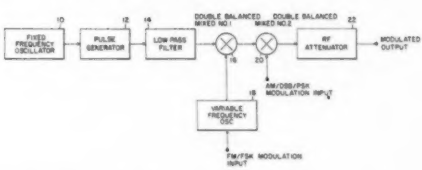
$$P_r = \sum_{m=r+1}^{n} \frac{\tan\left(\frac{\Omega_m}{\Omega_r}\psi_r\right)}{C_{m1}(\Omega_r - \Omega_m)^2} + \frac{\psi_r}{\Omega_r}\tan\psi_r \sec^2\psi_r + \sum_{m=1}^{r-1} \frac{\tan\psi_m}{C_{m1}(\Omega_r - \Omega_m)^2}$$

4,258,436

MULTICHANNEL RF SIGNAL GENERATOR

Kenneth J. Campbell, Solana Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 1, 1979, Ser. No. 62,834
Int. Cl.[3] H04B 17/00
U.S. Cl. 375—10 **9 Claims**



1. A multichannel RF signal generator comprising:

oscillatory pulse circuit means for providing a pulse train with a predetermined prf;

low pass filter means connected to said circuit means for removing undesired high frequency components;

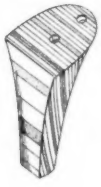
first mixer circuit means having a first input coupled to the output of said filter and having a second input coupled to receive a variable frequency signal and having an output; and

second mixer means having a first input coupled to the output of said first mixer means, a second input coupled to receive a variable amplitude signal and having an output signal spectrum comprising a plurality of identically modulated RF signals separated by a frequency spacing equal to the predetermined PRF;

wherein the output of the second mixer means is substantially the output of the generator.

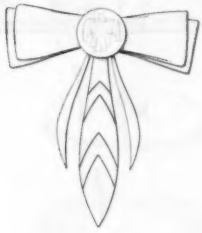
258,620
SHOE HEEL
Paul R. Goldman, 8 Joyce Ter., Andover, Mass. 01810
Filed Jan. 25, 1979, Ser. No. 6,441
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—323

258,621
SHOE HEEL
Paul R. Goldman, 8 Joyce Ter., Andover, Mass. 01810
Filed Jan. 25, 1979, Ser. No. 6,442
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—323

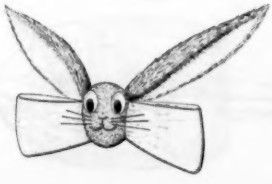


258,622
NECKTIE
Wendell P. Rosso, 1340 Alsace Ave., Norfolk, Va. 23509
Filed Feb. 22, 1979, Ser. No. 14,392
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D2—351

258,623
NECKTIE
Wendell P. Rosso, 1340 Alsace Ave., Norfolk, Va. 23509
Filed Feb. 22, 1979, Ser. No. 13,859
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D2—353



258,624
NECKTIE
Wendell P. Rosso, 1340 Alsace Ave., Norfolk, Va. 23509
Filed Feb. 22, 1979, Ser. No. 13,860
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D2—353



258,625

HEAT-PROTECTIVE ARM AND HAND GLOVE FOR HOT FOOD SERVICE

Darlene M. Sheridan, 1214 S. Rosewood, Santa Ana, Calif. 92707

Filed Jan. 10, 1979, Ser. No. 2,326

Term of patent 14 years

Int. Cl. D2—*06*

U.S. Cl. D2—365

258,627

SEAT OR SIMILAR ARTICLE

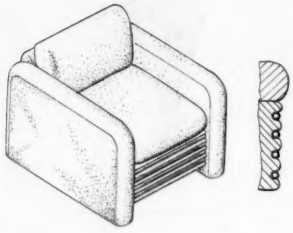
Matti Halme, Helsinki, Finland, assignor to Burris Industries, Incorporated

Filed Apr. 3, 1978, Ser. No. 893,174

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—71



258,626

CHAIN SAW CASE OR THE LIKE

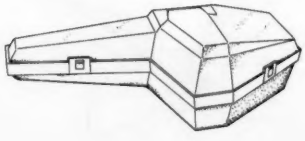
Andrew E. Dembicks, Raleigh, N.C., and Peter T. Schurman, Woodbridge, Conn., assignors to The Plastic Forming Company, Inc., Woodbridge, Conn.

Filed Mar. 29, 1978, Ser. No. 891,484

Term of patent 14 years

Int. Cl. D3—*02*

U.S. Cl. D3—30



258,628

ARMOIRE OR THE LIKE

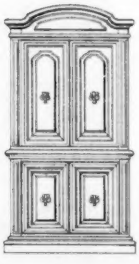
Harold V. Aulbert, High Point, N.C., assignor to Vaughan Furniture Company, Galax, Va.

Filed Apr. 4, 1978, Ser. No. 893,508

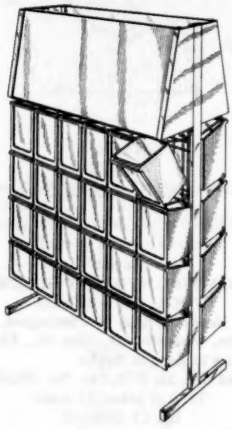
Term of patent 14 years

Int. Cl. D6—*04*

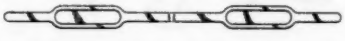
U.S. Cl. D6—154



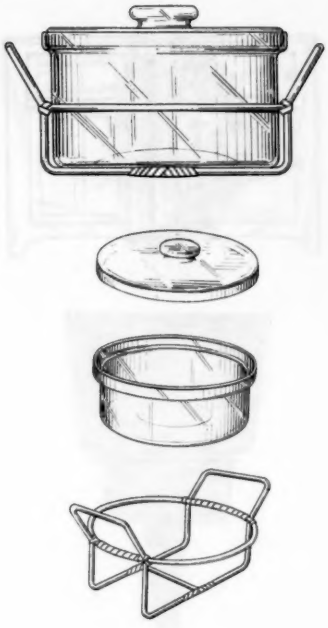
258,629
COMBINED DISPLAY AND STORAGE RACK FOR CLOTHING PATTERNS OR THE LIKE
Andrew C. Borzner, Jr., Short Hills, N.J., and Fred Howard, New York, N.Y., assignors to American Can Company, Greenwich, Conn.
Filed Nov. 17, 1977, Ser. No. 852,365
Term of patent 14 years
Int. Cl. D20—*02;* D6—*04*
U.S. Cl. D6—157



258,630
END CAP FOR FURNITURE SLATS
Stig Olenius, Bondstorp, Mansarp, Sweden
Filed May 30, 1978, Ser. No. 910,967
Claims priority, application Sweden, Nov. 28, 1977, 7700246
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

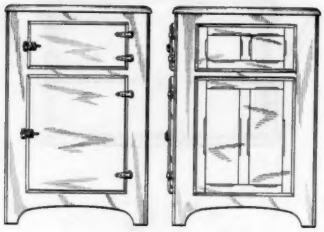


258,631
COMBINED COVERED CASSEROLE AND SERVING CRADLE
Michael Lax, New York, N.Y., assignor to Copco, Inc., New York, N.Y.
Filed Oct. 31, 1978, Ser. No. 956,241
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—3

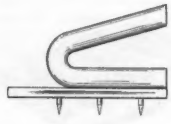


258,632
COMPARTMENTED FOOD TRAY OR THE LIKE
Nicholas D. Commisso, Victor, N.Y., assignor to Mobil Oil Corporation
Filed Jan. 5, 1979, Ser. No. 1,249
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—38

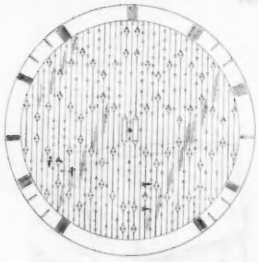
258,633
ICE BUCKET OR SIMILAR ARTICLE
James A. Geisheimer, 2 Overbrook Rd., Piscataway, N.J. 08854
Filed Jan. 18, 1979, Ser. No. 4,336
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—78



258,634
COMBINED FOOD HOLDER AND CARVING AID
Thomas S. Adams, 14 S. May Ave., Brooksville, Fla. 33512
Filed Nov. 2, 1978, Ser. No. 957,045
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—106

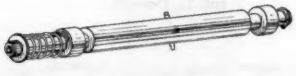


258,635
GRILL COVER
David S. Stone, and Maurice A. Sokoloff, both of 31-11 92nd St., Jackson Heights, N.Y. 11369
Filed Nov. 13, 1978, Ser. No. 959,663
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—131

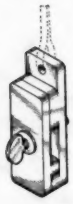


258,636
COLLAPSIBLE FIRE HYDRANT HOSE COUPLING TOOL, OR WRENCH
Samuel Boyko, deceased, late of Flemington, N.J., and by Zenovia Boyko, executrix, 21 Allen St., Flemington, N.J. 08822, assignors to Zenovia Boyko
Filed Oct. 16, 1978, Ser. No. 951,987
Term of patent 14 years
Int. Cl. D08—*05*
U.S. Cl. D8—27

258,637
CAM BORING TOOL
Henry Lillehoff, 16540 Sugargrove Dr., Whittier, Calif. 90604
Filed Mar. 3, 1978, Ser. No. 883,336
Term of patent 7 years
Int. Cl. D08—*01*
U.S. Cl. D8—98

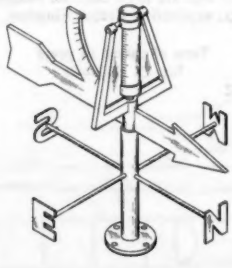


258,638
CLAMP
George Yim, 950 - 16th St., Ogden, Utah 84404
Filed Jun. 16, 1978, Ser. No. 916,240
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—394

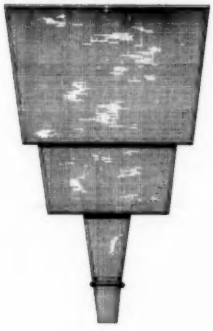


258,639
BOTTLE
David S. Lucas, 83 Whytehead Crescent, Kohimarama, Auckland, New Zealand
Filed May 2, 1978, Ser. No. 902,837
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—355

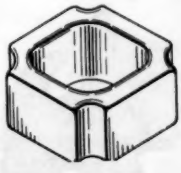
258,640
COMBINED RAIN AND WIND GAUGE
Jack D. Hefling, Rte. #1, Mount Hope, Kans. 67107
Filed Jan. 11, 1979, Ser. No. 2,789
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—53



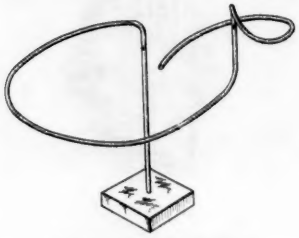
258,641
WIND THRESHOLD INDICATING BANNER
Charles F. Woodhouse, 314 Jefferson St., Clifton Forge, Va. 24422
Filed Sep. 12, 1977, Ser. No. 832,502
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—59



258,642
RING
Walter B. Bartkowski, 87 Oberlin St., Buffalo, N.Y. 14211
Filed Feb. 17, 1978, Ser. No. 879,103
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—26

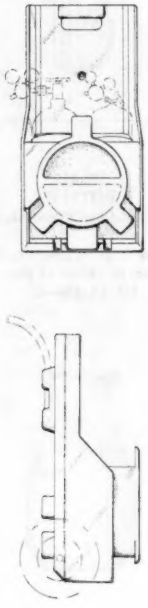


258,643
MOBILE
Earl M. Reiback, 20 E. 9th St., New York, N.Y. 10003
Filed Oct. 6, 1977, Ser. No. 840,119
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—141

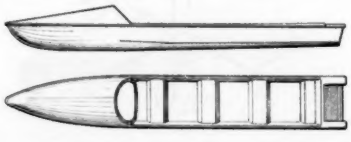


258,644
FIGURINE OF A SCOTTISH TERRIER
Jesus A. Carbajales Santa Eulalia, and Javier B. Carbajales Santa Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Irvine, Calif.
Filed Dec. 15, 1978, Ser. No. 970,009
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

258,645
WELDING EQUIPMENT CARRIER OR THE LIKE
Andrew E. Dembicks, Wake County, N.C., and Peter T. Schurman, New Haven County, Conn., assignors to The Plastic Forming Company, Inc., Woodbridge, Conn.
Filed Oct. 26, 1978, Ser. No. 954,906
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—32

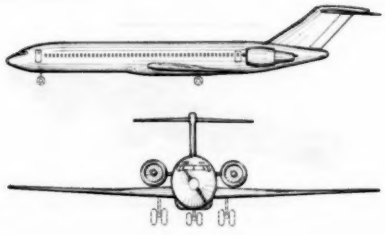


258,646
BOAT
Karl-Heinz Schwiemann, P. O. Box No. 99, Honiara
Filed Sep. 15, 1978, Ser. No. 943,544
Claims priority, application United Kingdom, Jul. 20, 1978, 985544/78
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



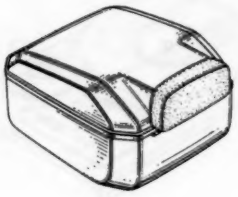
258,647
AIRPLANE
John F. Brown, Jr., and Boyce D. Jackson, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Aug. 19, 1977, Ser. No. 825,900
Term of patent 14 years
Int. Cl. 12—*07*
U.S. Cl. D12—80

258,648
AIRPLANE
Robert D. Martin, Auburn; Douglas S. Miller, Bellevue, and Kenneth P. Rice, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Dec. 14, 1977, Ser. No. 860,522
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—71

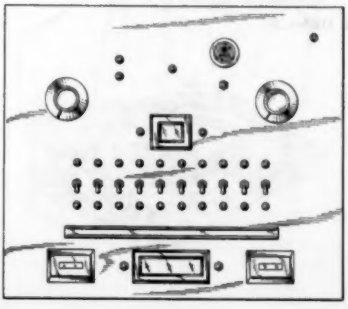


258,649
AIRPLANE
Murray A. Booth, Redmond; Everette L. Webb, Renton, and Bill Williams, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Aug. 31, 1977, Ser. No. 829,308
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—80

258,650
MOTORCYCLE TOTE BOX
Thomas S. Beaubien, Rancho Palos Verdes; Robert E. Oehring, Norwalk, and Dennis C. Rich, Long Beach, all of Calif., assignors to Bates Industries, Inc., Long Beach, Calif.
Filed Jun. 9, 1980, Ser. No. 157,549
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158

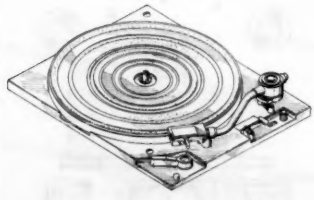


258,651
ELECTRICAL APPARATUS CONTROL PANEL
Philip Unger, Hanour Rd., and Bernard Dubbs, 239 Fox Meadow Rd., both of Scarsdale, N.Y. 10583
Filed Oct. 16, 1978, Ser. No. 951,408
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12

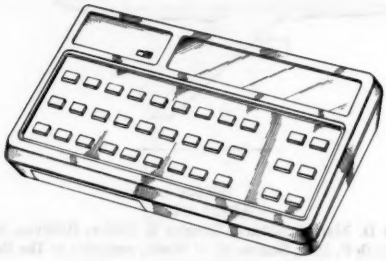


258,652
RECORD TURNTABLE
Claude Guillon, Bougival, France, assignor to Thomson-Brandt, Paris, France
Division of Ser. No. 871,578, Jan. 23, 1978. This application Oct. 15, 1979, Ser. No. 84,681
Claims priority, application France, Jul. 22, 1977, 77 75867
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—25

258,653
RECORD TURNTABLE
Raymond Vachus, Yzeure, France, assignor to Thomson-Brandt, Paris, France
Division of Ser. No. 871,579, Jan. 23, 1978. This application Oct. 15, 1979, Ser. No. 84,700
Claims priority, application France, Jul. 22, 1977, 77 75867
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—25



258,654
AN INFORMATION RETRIEVAL DEVICE OR SIMILAR ARTICLE
Michael Levy, Plantation, Fla., assignor to Lexicon Corporation, Miami, Fla.
Filed Nov. 17, 1978, Ser. No. 964,064
Term of patent 14 years
Int. Cl. D14—*02*; D18—*01*
U.S. Cl. D14—43

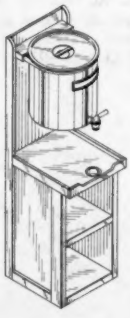


258,655
KEYBOARD AND DISPLAY UNIT FOR AN INFORMATION RETRIEVAL DEVICE OR SIMILAR ARTICLE
Michael Levy, Plantation, Fla., assignor to Lexicon Corporation, Miami, Fla.
Filed Nov. 17, 1978, Ser. No. 964,065
Term of patent 14 years
Int. Cl. D14—*02*; D18—*01*
U.S. Cl. D14—45

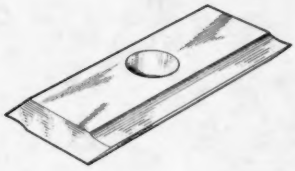
258,656
TELEPHONE HANDSET
David K. Vaughan, and Rodney J. Walters, both of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jan. 8, 1979, Ser. No. 2,009
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—64

258,657
AGRICULTURAL ROLLER
Crister Stark, Box 19, 59021 Väderstad, Sweden
Filed Dec. 5, 1977, Ser. No. 857,735
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—27

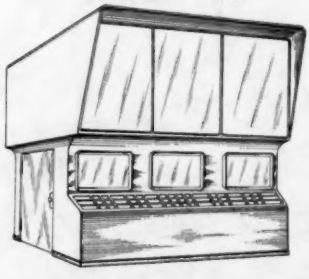
258,658
COMBINED LIQUID DISPENSING CONTAINER AND CABINET
James B. Hill, 1800 W. 33rd Ave., Denver, Colo. 80211
Filed Aug. 24, 1978, Ser. No. 936,236
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—112



258,659
CUTTING ELEMENT FOR A WOOD CHIPPING MACHINE
Kjell S. Nyström, and Gösta I. Larsson, both of Pitea, Sweden, assignors to Pitea Maskin-Industri Nyström & Larsson AB, Pitea, Sweden
Filed Dec. 27, 1977, Ser. No. 864,249
Claims priority, application Sweden, Jul. 1, 1977, 771456
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—139



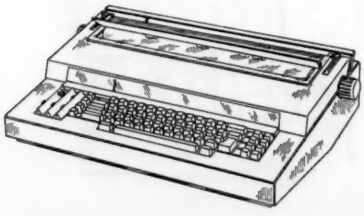
258,660
WALK-IN MULTIPLE SCREEN REAR PROJECTION DISPLAY UNIT
Jeffrey D. Berger, and Christine J. Berger, both of 7431 Third Ave., North Bergen, N.J. 07047
Filed May 10, 1978, Ser. No. 904,632
Term of patent 14 years
Int. Cl. D6—*06*; D16—*02*
U.S. Cl. D16—14



258,661
CAMERA TRIPOD OR THE LIKE
Yukinobu Shiraishi, Tokyo, Japan, assignor to Slik Tripod Co., Ltd., Saitama, Japan
Filed Apr. 24, 1978, Ser. No. 899,640
Claims priority, application Japan, Oct. 24, 1977, 52-41968
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—45

258,662
SUNGLASSES
Shigeki Sueyoshi, No. 7-13, 1-chome, Kamikita, Hirano-ku, Osaka-shi, Japan
Filed Oct. 19, 1977, Ser. No. 843,680
Claims priority, application Japan, Sep. 5, 1977, 52-35467
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

258,663
ELECTRONIC TYPEWRITER
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Dec. 26, 1978, Ser. No. 972,828
Claims priority, application Italy, Jun. 27, 1978, 53456/78[U]
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1

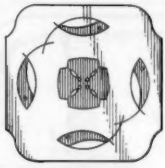


258,664
DESK TOP CALCULATOR
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Oct. 13, 1978, Ser. No. 951,235
Claims priority, application Italy, Apr. 14, 1978, 53189/78[U]
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

258,665
TYPEWRITER
Edward B. Bretschger, Cos Cob, Conn., assignor to Louis Marx & Co., Inc., Stamford, Conn.
Filed Feb. 9, 1979, Ser. No. 11,010
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1

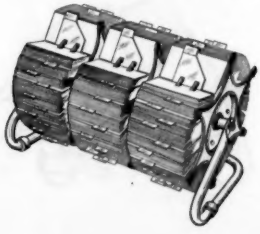
258,666
COMBINED ELECTRONIC CALCULATOR AND CLOCK
Eiichi Yoshioka, 2-13, Nakamura-kita, 2-chome, Nerima-ku, Tokyo, and Junichi Motoyoshi, 9-5, Shinden 2-chome, Ichikawa-shi, Chiba-ken, both of Japan
Filed Oct. 10, 1978, Ser. No. 949,549
Claims priority, application Japan, Apr. 10, 1978, 53-14222
Term of patent 14 years
Int. Cl. D10—*01*; D18—*01*
U.S. Cl. D18—7

258,667
BOOKMARK
Charles R. Minges, 612 Fayetteville Rd., Rockingham, N.C. 28379
Filed Sep. 27, 1978, Ser. No. 946,240
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—34

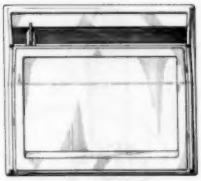


258,668
BILIARY TREE MODEL
James P. Moss, 250 E. Liberty St., Louisville, Ky. 40202
Filed Feb. 8, 1979, Ser. No. 10,428
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

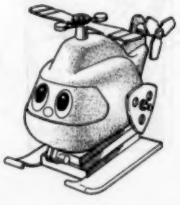
258,669
ROTARY CARD FILE
Hildaur L. Neilsen, Metuchen, N.J., assignor to Rolodex Corporation, Secaucus, N.J.
Filed Mar. 31, 1977, Ser. No. 783,383
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



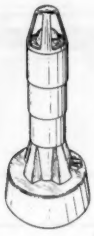
258,670
WALL MOUNTABLE INDEX FINDER
Jerome A. Grunstad, West St. Paul, Minn., assignor to Ketcham & McDougall, Incorporated, Roseland, N.J.
Filed Apr. 26, 1979, Ser. No. 33,621
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



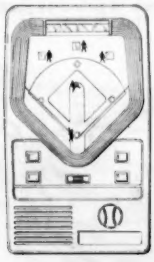
258,671
TOY HELICOPTER
Hisashi Sase, Chiba, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan
Filed May 23, 1978, Ser. No. 908,860
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—85



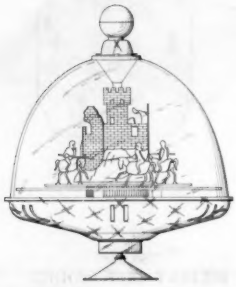
258,672
EXPLODING TOY ROCKET
Geoff Butcher, London, England, assignor to Hilary Page "Sensible" Toys Limited, Kenley, England
Filed Jan. 24, 1978, Ser. No. 872,352
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87



258,673
ELECTRONIC BASEBALL GAME CASING OR SIMILAR ARTICLE
Charles W. McHose, Hawthorne, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Jan. 5, 1979, Ser. No. 1,236
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

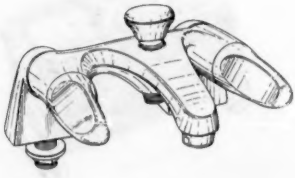


258,674
TOY SPINNING TOP
Peter K. Balleis, Zirndorf, Fed. Rep. of Germany, assignor to Lorenz Bolz GmbH & Co., Zirndorf, Fed. Rep. of Germany
Filed Apr. 17, 1979, Ser. No. 30,902
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 7537
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—97



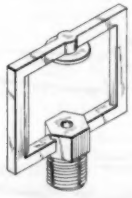
258,675
FLY CASTING ROD OR SIMILAR ARTICLE
Edwin J. Sisty, deceased, late of Denver, Colo., and by Yoshie Sisty, executrix, Brighton, Colo., assignors to Ed Sisty Angling Adventures, Inc., Denver, Colo.
Filed Feb. 24, 1978, Ser. No. 881,073
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

258,676
FAUCET
Luigi Colani, Sassenberg, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Fed. Rep. of Germany
Filed Aug. 6, 1979, Ser. No. 63,848
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 6937
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25

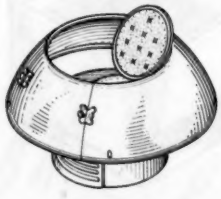


258,677
HAND SHOWER
Nils Larsson, Askim, Sweden, assignor to Arrow AB, Gothenburg, Sweden
Filed Nov. 1, 1978, Ser. No. 956,576
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

258,678
IRRIGATION SPRAY NOZZLE
Carl E. Addison, Rte. 1, Cimarron, Kans. 67835, and Rocky J. Comes, Box 24, Offerle, Kans. 67563
Continuation-in-part of Ser. No. 881,880, Feb. 27, 1978, and Ser. No. 58,003, Jul. 16, 1979. This application Jan. 17, 1980, Ser. No. 113,082
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

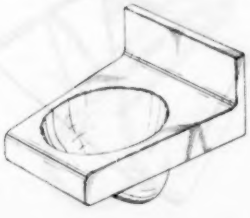


258,679
CHILD TOILET TRAINING CENTER
Doris J. Johnson, 8301 S. 88th Ave., 4 Hickory Trace Dr., Bldg. 26, Apt. 116, Chicago, Ill. 60458
Continuation-in-part of Ser. No. 726,657, Sep. 27, 1976. This application Feb. 21, 1978, Ser. No. 879,820
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—53

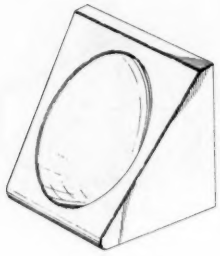


258,680
LAVATORY
Gordon M. Wilson, Tring, England, assignor to W. & G. Sissons, Limited, Sheffield, England
Filed Apr. 28, 1978, Ser. No. 901,261
Claims priority, application United Kingdom, Nov. 25, 1977, 982399/77
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58

258,681
WATER CLOSET
Gordon M. Wilson, Tring, England, assignor to W. & G. Sissons, Limited, Sheffield, England
Filed Apr. 28, 1978, Ser. No. 901,262
Claims priority, application United Kingdom, Nov. 25, 1977, 982398/77
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—67

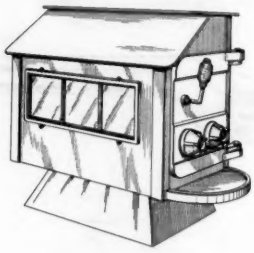


258,682
URINAL
Gordon M. Wilson, Tring, England, assignor to W. & G. Sissons, Limited, Sheffield, England
Filed Apr. 28, 1978, Ser. No. 901,265
Claims priority, application United Kingdom, Nov. 25, 1977, 982402/77
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—68

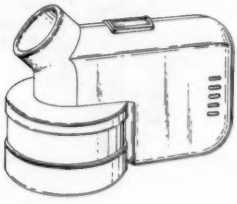


258,683
COVER FOR SANITARY PIPE FITTINGS
Gordon M. Wilson, Tring, England, assignor to W. & G. Sissons, Limited, Sheffield, England
Filed Apr. 28, 1978, Ser. No. 901,264
Claims priority, application United Kingdom, Nov. 25, 1977, 982401/77
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

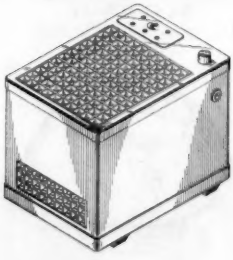
258,684
WOOD STOVE
John C. Christophel, Rte. 4, Box 266A, Harrisonburg, Va. 22801
Filed Jan. 19, 1979, Ser. No. 4,991
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



258,685
VAPORIZER
Ernst Reichl, Munich, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jan. 10, 1978, Ser. No. 868,472
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 4692
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—148



258,686
COMBINED AIR FILTER AND FRESHENER
Kenneth O. Johnson, Rte. 5, Riverhaven, St. Cloud, Minn. 56301
Filed Jan. 15, 1979, Ser. No. 3,305
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—149

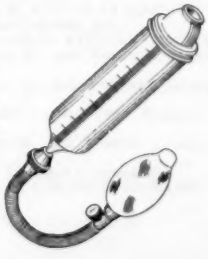


258,687
THERAPEUTIC PERCUSSION DEVICE FOR RELIEVING STIFF SHOULDERS
Akinaga Katsube, 5-15-8, Daitakubo, Urawa, Saitama, Japan
Filed Jun. 26, 1978, Ser. No. 919,273
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—36

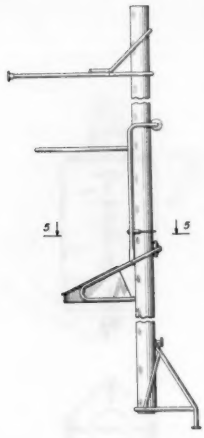
258,688
ASPIRATOR TUBE
Joseph Hodge, 1008 Wendover Way, Spartanburg, S.C. 29303
Continuation-in-part of Ser. No. 661,963, Feb. 27, 1976, Pat. No. D. 248,969. This application Dec. 12, 1977, Ser. No. 859,964
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—54

258,689
RECEPTACLE SUITABLE FOR MEDICAL FLUIDS
Louis T. Pagels, Hanover Park, Ill., assignor to Automatic Liquid Packaging, Inc.
Filed Feb. 10, 1978, Ser. No. 876,851
Term of patent 14 years
Int. Cl. D24—*04*; D9—*01*
U.S. Cl. D24—58

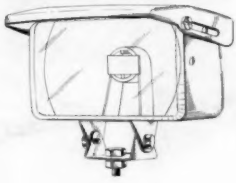
258,690
MALE GENITAL STRENGTHENING DEVICE
An C. Wu, No. 118-3, Hsin-Yi Rd., Section 3, Taipei, Taiwan
Filed Apr. 14, 1978, Ser. No. 896,626
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—99



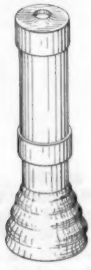
258,691
SCAFFOLD
Curt L. Nyman, Skolvägen 22, Aplared, Sweden
Filed Jun. 16, 1978, Ser. No. 916,056
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—68



258,692
COMBINED AUXILIARY HEADLIGHT AND COVER THEREFOR
Yukiharu Ozeki, Yokohama, Japan, assignor to Ushio Denki Kabushiki Kaisha, Japan
Filed Sep. 25, 1978, Ser. No. 945,461
Claims priority, application Japan, Aug. 18, 1978, 53-34726
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—28



258,693
PIPE COVER
Charles L'Heureux, 650 Murray La., Des Plaines, Ill. 60016
Filed Aug. 25, 1978, Ser. No. 936,918
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—05



258,694
MAKEUP CENTER
John deHaseth, Whittier, Calif., assignor to Jonee, Inc., Sante Fe Springs, Calif.
Filed May 11, 1979, Ser. No. 38,005
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—68

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TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF MARCH, 1981

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John, Heinrich; and Koster, Eike, 4,257,665, Cl. 339-186.00M.
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Hooker, Donald E., 4,257,512, Cl. 194-100.00A.
Balogh, Thomas K., to Schlegel Corporation. Flexible sheet seal. 4,257,645, Cl. 296-166.000.
Baltimore Aircoil Co.: *See*—
Thur, Gerry W.; and Moore, Timothy A., 4,257,745, Cl. 417-18.000.
Balz, Gunther W., to Roto-Finish Company, Inc. Finishing machine and process. 4,257,198, Cl. 51-313.000.
Balzarini, Giovanni; and Papeschi, Roberto, to U.S. Philips Corporation. Device for selecting values of data elements. 4,258,426, Cl. 364-518.000.
Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten: *See*—
Brunger, Wilhelm; and Mollenstedt, Gottfried, 4,258,283, Cl. 313-336.000.
Bancroft, Donald G. Rollable body. 4,257,605, Cl. 273-128.00A.
Bandow, Kowzo: *See*—
Matsuura, Ryo; Sakai, Kazuaki; Sato, Tuneyasu; Yamada, Yorinobu; and Bandow, Kowzo, 4,257,851, Cl. 203-31.000.
Bandukwalla, Phiroze; Mount, Gordon L.; and Kirtland, Howard W., to Carrier Corporation. Diffuser control. 4,257,733, Cl. 415-13.000.
Bandy, Irvin C. Portable observation stand. 4,257,490, Cl. 182-116.000.
Banks, Allen R.; Fibiger, Richard F.; and Jones, Ted, to University Patents, Inc. Acrylate ester monomer production. 4,258,204, Cl. 560-205.000.
Banks, Ridgway M. Heat engine. 4,257,231, Cl. 60-527.000.
Bankstahl, Herbert A., to Brunswick Corporation. Shifter linkage for a cone clutch. 4,257,506, Cl. 192-21.000.
Banzai, Keiichiro: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,258,307, Cl. 322-28.000.
Barbaudy, Alain; and Galaup, Jacques, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Fixed optical attenuator for light rays guided by optical fibres. 4,257,671, Cl. 350-96.150.
Barber Heavy Oil Process, Inc.: *See*—
Allen, Joseph C., 4,257,650, Cl. 299-2.000.
Barker, Becky S.: *See*—
Barker, Gary L.; and Barker, Becky S., 4,257,166, Cl. 33-185.00R.
Barker, David L., to CPG Products Corp. Toy dolls and figurines having surface portions of reversibly changeable color. 4,257,188, Cl. 46-156.000.
Barker, Gary L.; and Barker, Becky S. Adjustable drill template. 4,257,166, Cl. 33-185.00R.
Barnes, Wilson J.: *See*—
Lupinski, John H.; and Barnes, Wilson J., 4,257,861, Cl. 204-181.00R.
Barnette, William E.: *See*—
Nicolaou, Kyriacos C.; Barnette, William E.; Magolda, Ronald L.; and Lysenko, Zenon, 4,258,199, Cl. 549-51.000.
Barney, Marshall, to Celanese Corporation. Filter core extender and seal. 4,257,894, Cl. 210-232.000.
Barnsley, Michael P.; Eccles, Edward S.; and Taylor, Ralph, to Smiths Industries Limited. Control systems. 4,257,311, Cl. 91-363.00A.
Barr, Thomas A. Explosive gas detector. 4,258,002, Cl. 422-95.000.
Barreiro, Agustin J.; Lowe, Charles M. T.; LeFever, JoAnne; and Pyman, Ronald L., to Gardinier, Inc. Method of purifying uranium tetrafluoride hydrate and preparing uranium (VI) peroxide hydrate using a fluoride complexing agent. 4,258,012, Cl. 423-8.000.
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., to Ceskoslovenska Akadamie ved; and Akademija Nauk SSSR. Acousto-optic device. 4,257,685, Cl. 350-358.000.
Bartell, Jeffrey M.; and D'Elia, Robert V., to Goodyear Tire & Rubber Company, The. Method and apparatus for splicing hose. 4,257,630, Cl. 285-21.000.
Bartholomew, Donald D., to Merit Plastics, Inc. Window regulator and drive assembly. 4,257,192, Cl. 49-140.000.
Bartmann, Wilhelm; Beck, Gerhard; Reuschling, Dieter-Bernd; Seeger, Karl; and Teufel, Hermann, to Hoechst Aktiengesellschaft. Thienylprostaglandins and process for their manufacture. 4,258,053, Cl. 424-275.000.
Bartmann, Wilhelm; Beck, Gerhard; Lerch, Ulrich; and Bickel, Martin, to Hoechst Aktiengesellschaft. Prostaglandin derivatives of the Δ2,4-11-deoxy-PEG series. 4,258,057, Cl. 424-305.000.
Bartoldus, Dieter; and Broger, Emil, to Hoffmann-La Roche Inc. Process for manufacturing sodium pantothenate. 4,258,210, Cl. 562-569.000.
Barton, John E. D.; Headford, Donald W. R.; and Collins, David J., to Imperial Chemical Industries Limited. Cotton desiccation with phenoxyalkanoic acids. 4,257,801, Cl. 71-70.000.
Barton, Steven A.; and Anderson, Steven G. Retractable stimulation electrode apparatus and method. 4,257,428, Cl. 128-785.000.
Bascle, Joseph A., Jr. Upgrader variable pressure regulator. 4,257,378, Cl. 123-512.000.
BASF Aktiengesellschafft: *See*—
Koenig, Karl-Heinz; Oeser, Heinz-Guenter; and Feuerherd, Karl-Heinz, 4,257,974, Cl. 260-453.00A.
BASF Aktiengesellschaft: *See*—
Fischer, Martin; Kuesters, Werner; Penzel, Erich; Rehder, Wolfgang; and Trautmann, Walter, 4,257,859, Cl. 204-159.230.
Hoerauf, Werner; and Valentin, Guenter, 4,258,178, Cl. 528-502.000.
Horacek, Heinrich; Gehm, Robert; Volkert, Otto; Chakrabarti, Sarbananda; Pauls, Mathias; and Weyland, Peter, 4,258,140, Cl. 521-114.000.
Horn, Peter; Grosskinsky, Otto-Alfred; Thoma, Richard; and Fuchs, Hugo, 4,257,950, Cl. 260-239.30A.
Jarre, Wolfgang; Mueller, Gerhard; Zipp, Otmar; and Ropte, Eckhard, 4,258,141, Cl. 521-114.000.
Pfeiffer, Erich, 4,258,158, Cl. 526-68.000.
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,257,941, Cl. 260-152.000.
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Bauer, Dieter: *See*—
Tax, Hans; Hosler, Klaus; and Bauer, Dieter, 4,257,618, Cl. 280-6.110.
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Ritzmann, Horst; Bauer, Klaus; Schmits, Heinz-Herbert; Goldmann, Wolf; and Korn, Hennig, 4,257,766, Cl. 432-14.000.
Bauer, Wolfgang. Automotive service tool. 4,257,163, Cl. 30-180.000.
Bayer Aktiengesellschaft: *See*—
Arend, Gunter; Behrenz, Wolfgang; and Block, Hans-Dieter, 4,257,987, Cl. 260-956.000.
Beecken, Hermann, 4,258,182, Cl. 542-421.000.
Mohring, Edgar; Muller, Hanns P.; and Wagner, Kuno, 4,258,222, Cl. 568-863.000.
Reinehr, Ulrich; and Druschke, Frank, 4,257,999, Cl. 264-203.000.
Schulte, Klaus; Ersfeld, Heinrich; and Wirtz, Hans, 4,257,992, Cl. 264-45.300.
Bayers, Jon H. Intraocular lens mechanism. 4,257,130, Cl. 3-13.000.
Baylis, Anthony B.: *See*—
Slinkard, William E.; and Baylis, Anthony B., 4,257,921, Cl. 252-462.000.
BBC Brown Boveri & Company Limited: *See*—
Kaelber, Gunter, 4,257,233, Cl. 60-687.000.
Kaufmann, Meinolph; and Kmetz, Allan R., 4,258,364, Cl. 340-765.000.
Starcevic, Mihailo, 4,258,280, Cl. 310-157.000.
von Bockh, Peter, 4,257,360, Cl. 122-412.000.
Beal, Charles B., to Health Development Corporation. Gastro-intestinal tube guide and stiffener. 4,257,421, Cl. 128-348.000.
Beall, Nelson J., to General Mills, Inc. Method of reproduction metallized patterns with microwave energy. 4,258,086, Cl. 219-10.430.
Beaton, John M., to Upjohn Company, The. Bisnoraldehyde-22-enamine process. 4,257,949, Cl. 260-239.55R.
Beatson, Michael F. F.; and Nunn, Terence M. Pressure sensing apparatus and engine analyzing apparatus. 4,257,260, Cl. 73-119.00A.
Beaver, Robert, to North Bend Fabrication & Machine, Inc. Powered implement with work elements pivotally mounted on an implement mounting and a torque tube for rotating such mounting. 4,257,731, Cl. 414-694.000.
Beck, Gerhard: *See*—
Bartmann, Wilhelm; Beck, Gerhard; Reuschling, Dieter-Bernd; Seeger, Karl; and Teufel, Hermann, 4,258,053, Cl. 424-275.000.
Bartmann, Wilhelm; Beck, Gerhard; Lerch, Ulrich; and Bickel, Martin, 4,258,057, Cl. 424-305.000.
Beck, Wesley H. Switch assembly. 4,258,237, Cl. 200-11.00J.

Becker, Karl-Heinz: *See*—
Jonas, Rochus; Becker, Karl-Heinz; Enenkel, Hans-Joachim; Minck, Klaus; and Schliep, Hans-Jochen, 4,258,062, Cl. 424-330.000.
Beckham, David E., to Unidynamics/St. Louis, Inc. Hoisting system. 4,257,493, Cl. 187-20.000.
Bect Chemical Co.: *See*—
Chester, Richard M., 4,257,924, Cl. 252-547.000.
Becton, Dickinson and Company: *See*—
Kessler, Stephen B., 4,257,886, Cl. 210-516.000.
Mehl, Jack J., 4,258,032, Cl. 424-148.000.
Beecham Group Limited: *See*—
Harbridge, John B., 4,258,050, Cl. 424-272.000.
Beecken, Hermann, to Bayer Aktiengesellschaft. Quaternized amino-substituted styryl dyestuffs. 4,258,182, Cl. 542-421.000.
Beers, Melvin D., to General Electric Company. Curable compositions and process. 4,257,932, Cl. 260-18.00S.
Beguin, Alain; Zann, Annie; and Dubois, Jean-Claude, to Thomson-CSF. Liquid crystal of diester type exhibiting a smectic phase, with low frequency of dielectric isotropy, and display device utilizing this crystal. 4,257,910, Cl. 252-299.000.
Begunov, Nikolai N.: *See*—
Kudryavtsev, Boris B.; Krasnokutsky, Valentin P.; Fedotov, Lev A.; Sholk, Semen F.; Svidler, Jury R.; Zhigarev, Ivan V.; Begunov, Nikolai N.; Kostylev, Valentin F.; Brodsky, Jury M.; and Knyazev, Vadim A., 4,257,888, Cl. 210-97.000.
Behrenz, Wolfgang: *See*—
Arend, Gunter; Behrenz, Wolfgang; and Block, Hans-Dieter, 4,257,987, Cl. 260-956.000.
Belden Corporation: *See*—
Gibbs, Ronald D., 4,257,659, Cl. 339-36.000.
Belfer, Kenneth H.; Stewart, Arnold; and Tavare, Russell, to STB Transformer Company. Current measuring transformer. 4,258,348, Cl. 336-73.000.
Beling, Thomas E., to Sigma Instruments, Inc. Switching circuit for connecting an AC source to a load. 4,258,276, Cl. 307-252.00B.
Bell, Ealious D. Calcium carbide power system. 4,257,232, Cl. 60-676.000.
Bell & Howell Company: *See*—
Stefansson, Rafn; and Westover, Dwight G., 4,257,324, Cl. 101-93.010.
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., to Colt Industries Operating Corp. Over current protection system for electrical discharge machining apparatus. 4,258,243, Cl. 219-69.00S.
Bell Telephone Laboratories, Incorporated: *See*—
Andrejco, Matthew J.; and MacChesney, John B., 4,257,797, Cl. 65-3.00A.
Beni, Gerardo; Dautremont-Smith, William C.; Schiavone, Lawrence M.; and Shay, Joseph L., 4,257,856, Cl. 204-129.000.
Blahut, Donald E.; Copp, David H.; and Stanzione, Daniel C., 4,258,419, Cl. 364-200.000.
Bordelon, Chester M.; and Sherwood, Richard C., 4,258,234, Cl. 179-114.00R.
Bordelon, Chester M.; and Sherwood, Richard C., 4,258,234, Cl. 179-114.00R.
Celler, George K.; and Seidel, Thomas E., 4,258,078, Cl. 427-43.100.
Jackson, Kenneth A.; Kimerling, Lionel C.; and Leamy, Harry J., 4,257,824, Cl. 148-1.500.
Maldonado, Juan R., 4,258,262, Cl. 250-419.000.
Sherman, Charles J., 4,258,411, Cl. 361-386.000.
Belle, Pierre; and Poux, Jacques, to Alsthom-Atlantique. Electrolyzer cell. 4,257,866, Cl. 204-253.000.
Beloit Corporation: *See*—
Schmitt, Arnold J.; and Rempel, Cornelius, 4,257,844, Cl. 162-305.000.
Benasutti, John E., to GTE Products Corporation. Tool for cleaving optical fibers. 4,257,546, Cl. 225-96.500.
Benasutti, John E.: *See*—
Griffin, Wendell L.; Carlsen, W. John; and Benasutti, John E., 4,257,674, Cl. 350-96.210.
Bender, Heinz; Beyerle, Rudi; Piesch, Steffen; and Martorana, Piero A., to Cassella Aktiengesellschaft. Pyrazino-carbazoles, process for the production thereof and pharmaceutical agents. 4,258,043, Cl. 424-250.000.
Bendig, Lothar; and Hoferer, Richard, to Filterwerk Mann & Hummel GmbH. One-way throttling valve for pneumatic membrane actuator in engine air intake system. 4,257,380, Cl. 123-552.000.
Bendix Corporation, The: *See*—
Brush, Robert W.; Werth, Dee A.; and Schildkraut, Alan L., 4,257,663, Cl. 339-89.00M.
Bunger, Dennen J., 4,257,281, Cl. 74-6.000.
Goodrich, George W., 4,257,703, Cl. 356-4.000.
Henrich, Robert S., 4,258,324, Cl. 324-392.000.
Wen, Gene Y., 4,257,376, Cl. 123-472.000.
Benedyk, Joseph C., to Brunswick Corporation. Molding nonwoven needle punched fabrics into three dimensional shapes. 4,258,093, Cl. 428-85.000.
Benedyk, Joseph C., to Brunswick Corporation. Melt bonded fabrics and a method for their production. 4,258,094, Cl. 428-85.000.
Benedyk, Joseph C., to Brunswick Corporation. Non-woven low modulus fiber fabrics. 4,258,097, Cl. 428-224.000.
Beneze, Heinz W., to Firestone Tire & Rubber Company, The. Pneumatic tire. 4,257,836, Cl. 156-125.000.
Beni, Gerardo; Dautremont-Smith, William C.; Schiavone, Lawrence M.; and Shay, Joseph L., to Bell Telephone Laboratories, Incorporated. Electrolytic process useful for the electrolysis of water. 4,257,856, Cl. 204-129.000.
Bennett, George T.; and Brucken, Byron L., to General Motors Corporation. Electromagnetic rotating coil clutch. 4,257,508, Cl. 192-84.00A.
Berezin, Ilia V.; Goldmakher, Viktor S.; Klibanov, Alexandr M.; Martinek, Karel; Mishin, Alexandr A.; Samokhin, Gennady P.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; and Chazov, Evgeny I., to Vsesojuzny Kardiologichesky Nauchny Tsentr Akademii Meditsinskikh Nauk SSSR. Method and apparatus for producing visible image of object. 4,257,269, Cl. 73-606.000.
Berg, Dennis G., to Winfred M. Berg, Inc. Lock washer. 4,257,465, Cl. 151-38.000.
Berger, Rudolf: *See*—
Schmidt, Herbert; Kurz, Erwin; Berger, Rudolf; and Pilz, Erich, 4,257,728, Cl. 414-468.000.
Berglund, Neil C.; and Luick, David A., to International Business Machines Corporation. System for interfacing between main store memory and a central processor. 4,258,417, Cl. 364-200.000.
Bergna, Horacio E., to Du Pont de Nemours, E. I., and Company. Petroleum refinery processes using catalyst of aluminosilicate sols and powders. 4,257,874, Cl. 208-111.000.
Bergquist, Dwight H.; and Lorimor, Gary D., to Henningsen Foods, Inc. Quick change filter bag arrangement. 4,257,790, Cl. 55-379.000.
Bergsma, Wijtes: *See*—
Bijl, Hendrik A. C.; and Bergsma, Wijtes, 4,257,161, Cl. 30-43.600.
Bergwerksverband GmbH: *See*—
Bogenschneider, Bernd; Kohling, Rolf; Kubitza, Heinz; Blankmeister, Wilhelm; and Leininger, Dieter, 4,257,879, Cl. 209-5.000.
Berlin, Alfred A.; Kefeli, Tamara Y.; Varlamova, Nina V.; Strongin, Grigory M.; Altshuler, Judif M.; Kolomazov, Boris I.; and Efimov, Alexei V. Reticulate polymers based on oligourethanacrylates and method for their manufacture. 4,258,164, Cl. 526-301.000.
Bernard, Nicolle; and Mahieu, Jean-Rene, to Societe Lignes Telegraphiques et Telephoniques. Lumped circuit circulator with adjustable band widening circuit. 4,258,339, Cl. 333-1.100.
Bernard, Vincent E., to Jimmy Dean Meat Company, Inc., The. Process for extruding and forming portion controlled frozen food. 4,258,066, Cl. 426-231.000.
Bernard, William: *See*—
Bruhn, Alfred; and Bernard, William, 4,257,579, Cl. 266-141.000.
Bernstein, Seymour: *See*—
Joseph, Joseph P.; and Bernstein, Seymour, 4,258,034, Cl. 424-180.000.
Lewis, Arthur J.; and Bernstein, Seymour, 4,258,180, Cl. 536-112.000.
Bertagni, Jose J. Mouting of a substantially planar diaphragm defining a sound transducer. 4,257,325, Cl. 181-172.000.
Berthet, Jeanne: *See*—
Guerrini, Jacques; Berthet, Jeanne; Gaussens, Gilbert; and Lemaire, Francis, 4,258,156, Cl. 525-531.000.
Bertolacini, Ralph J.: *See*—
Kim, Dae K.; Bertolacini, Ralph J.; Gutberlet, L. Charles; and Robinson, Ken K., 4,257,922, Cl. 252-465.000.
Bertus, Brent J.: *See*—
Roberts, John S.; McKay, Dwight L.; Bertus, Brent J.; and Mark, H. Wayne, 4,257,919, Cl. 252-461.000.
Betenbaugh, Walter R. Log supporting apparatus for use with fireplace grates. 4,257,392, Cl. 126-164.000.
Betts, Robert K.; Grisik, John J.; and Zelahy, John W., to General Electric Company. Turbine engine blade with airfoil projection. 4,257,741, Cl. 416-190.000.
Bevilacqua, Silvio; and Gislon, Renato, to Comitato Nazionale per l'Energia Nucleare-CNEN. Direct conversion solar electric generator. 4,257,823, Cl. 136-206.000.
Beyerle, Rudi: *See*—
Bender, Heinz; Beyerle, Rudi; Piesch, Steffen; and Martorana, Piero A., 4,258,043, Cl. 424-250.000.
Bezrukov, Sergei V.: *See*—
Semashko, Andrei P.; Gimaev, Nasikh Z.; Maximov, Ivan V.; Bezrukov, Sergei V.; and Rabinovich, Vladimir B., 4,257,865, Cl. 204-224.00M.
BF Goodrich Company, The: *See*—
Allen, Ronald E., 4,258,083, Cl. 427-209.000.
Bhatnagar, Satpal: *See*—
Gutjahr, Rolf; and Bhatnagar, Satpal, 4,257,783, Cl. 55-61.000.
Bi-M Instrument Company: *See*—
Mayeaux, Donald P., 4,257,439, Cl. 137-88.000.
Bianco, Andrew S., to Huffy Corporation. Wrench. 4,257,288, Cl. 81-66.00R.
Bickel, Martin: *See*—
Bartmann, Wilhelm; Beck, Gerhard; Lerch, Ulrich; and Bickel, Martin, 4,258,057, Cl. 424-305.000.
Bienfait, Charles, to Solvay & Cie. Process for the polymerization of olefins. 4,258,159, Cl. 526-114.000.
Bijl, Hendrik A. C.; and Bergsma, Wijtes, to U.S. Philips Corporation. Dry-shaving apparatus. 4,257,161, Cl. 30-43.600.
Billeruds Aktiebolag: *See*—
Kullander, Mats O., 4,257,343, Cl. 118-50.000.
Billows, Mitchell J.: *See*—
Whitehouse, Martin H.; and Billows, Mitchell J., 4,257,285, Cl. 74-405.000.
Binney, Robert L. Protective gun cover. 4,257,464, Cl. 150-52.00R.
Birk, Adalbert: *See*—
Walz, Alfred; and Birk, Adalbert, 4,257,270, Cl. 73-620.000.

Birnbaum, Manfred E.: *See—*
Giras, Theodore C.; and Birnbaum, Manfred E., 4,258,424, Cl. 364-494.000.

Biro, Alexander J., to Armcor Industries, Inc. Aluminum frame window with improved thermal insulation and method of making same. 4,257,202, Cl. 52-204.000.

Bixby, James A.; Wright, Charles E.; and Kammerer, GilbertE., to Eastman Kodak Company. Apparatus for preventing flutter and skew in electrical signals. 4,258,398, Cl. 360-76.000.

Bjornson, Geir, to Phillips Petroleum Company. Polycyclic phenols, alcohols and ketones from phenols, cyclic alcohols and cyclic ketones using a nickel oxide/manganese oxide/magnesium oxide catalyst in presence of at least one of hydrogen and nitrogen. 4,258,268, Cl. 568-350.000.

Bjornson, Geir: *See—*
Knudsen, Ronald D.; and Bjornson, Geir, 4,258,221, Cl. 568-806.000.

Blahut, Donald E.; Copp, David H.; and Stanzione, Daniel C., to Bell Telephone Laboratories, Incorporated. Data processing apparatus providing variable operand width operation. 4,258,419, Cl. 364-200.000.

Blaik, Robert: *See—*
Matos, R. Jay; Matos, Eliseo J.; and Blaik, Robert, 4,257,988, Cl. 264-1.100.

Blaimschein, Gottfried; and Marzy, Otto, to GFM Gesellschaft fuer Fertigungstechnik und Maschinenbau Aktiengesellschaft. Milling tool for machining cylindrical sections. 4,257,724, Cl. 409-232.000.

Blankmeister, Wilhelm: *See—*
Bogenschneider, Bernd; Kohling, Rolf; Kubitza, Heinz; Blankmeister, Wilhelm; and Leininger, Dieter, 4,257,879, Cl. 209-5.000.

Blasio, Pietro, to Italrame S.p.A. Device for storing, transporting, lifting and utilizing wire rod. 4,257,523, Cl. 206-303.000.

Block, Hans-Dieter: *See—*
Arend, Gunter; Behrenz, Wolfgang; and Block, Hans-Dieter, 4,257,987, Cl. 260-956.000.

Blohm & Voss AG: *See—*
Wober, Wolfram; Franzius, Dirk; Andersson, Gerd; Jung, Klaus; Suess, Peter; and Wagner, Claus, 4,257,889, Cl. 210-104.000.

Blomberg, Peter E., to Aktiebolaget Electrolux. Safety arrangement in a gas operated apparatus. 4,257,758, Cl. 431-27.000.

Blomquist, James E.: *See—*
Wilczewski, Robert H.; and Blomquist, James E., 4,257,282, Cl. 74-125.000.

Blue Metal and Gravel Pty. Ltd.: *See—*
Carroll, John; Dearing, Harry; Swain, Keith; and Naughton, Warren, 4,257,168, Cl. 34-17.000.

Blumenstein, Fritz: *See—*
Ashauer, Karl; and Blumenstein, Fritz, 4,257,284, Cl. 74-339.000.

Board of Trustees, Michigan State University: *See—*
Gansow, Otto A.; and Triplett, Kelly B., 4,257,955, Cl. 260-338.000.

Bodine, Albert G. Non-resonant cyclic drive system employing rectification of the cyclic output. 4,257,648, Cl. 299-37.000.

Bodmer, Maximiliaan H.; Hoogstraate, Hendrik; and Van Rooyen, Gerrit, to Hollandse Signaalapparaten B.V. Phased array radar. 4,258,363, Cl. 343-16.00R.

Boehringer Ingelheim GmbH: *See—*
Asp, Peter; Jarsen, Dieter; Eggert, Heinrich; and Klingelholler, Wilhelm, 4,257,838, Cl. 156-439.000.

Boehringer Mannheim GmbH: *See—*
Witte, Ernst-Christian; Wolff, Hans P.; Thiel, Max; Stegmeier, Karlheinz; and Roesch, Egon, 4,258,058, Cl. 424-309.000.

Boenig Company, The: *See—*
Diepenbrock, James L., Jr.; Nelsen, M. Dean; and Harp, Marlyn F., 4,257,998, Cl. 264-156.000.

Boersma, Donald J. Drain cover. 4,257,892, Cl. 210-163.000.

Boersma, Rintje, to Coq B.V. High voltage distribution system with movable voltage measuring transformer. 4,258,410, Cl. 361-332.000.

Bogenschneider, Bernd; Kohling, Rolf; Kubitza, Heinz; Blankmeister, Wilhelm; and Leininger, Dieter, to Bergwerksverband GmbH. Process for dewatering coal slurries. 4,257,879, Cl. 209-5.000.

Bognin, Franco; and Colombo, Bruno, to Carlo Erba Strumentazione S.p.A. Method and apparatus for chemical analysis of specimens. 4,257,772, Cl. 23-230.0PC.

Bogri, Tibor: *See—*
Bagli, Jehan F.; and Bogri, Tibor, 4,258,188, Cl. 544-364.000.

Bohr Scientific Corporation: *See—*
Parsons, Frederick L., 4,257,267, Cl. 73-425.600.

Boise Cascade Corporation: *See—*
Roder, Hugh H.; Denningmann, Elroy; and Thornhill, Dewey B., 4,257,316, Cl. 493-68.000.

Bollinger, John G.: *See—*
Ramsey, Paul W.; and Bollinger, John G., 4,258,425, Cl. 364-513.000.

Bompard, Bruno, to Commissariat a l'Energie Atomique. Method of manufacture of material reinforced with a three-dimensional textile structure. 4,257,835, Cl. 156-92.000.

Bonati, Attilio: *See—*
Lietti, Andrea; and Bonati, Attilio, 4,258,055, Cl. 424-283.000.

Bondinell, William E.; and Girard, Gerald R., to SmithKline Corporation. Inhibiting phenylethanolamine N-methyltransferase with thiadiazolo and oxadiazolotetrahydroisoquinolines. 4,258,049, Cl. 424-258.000.

Bondoc, Alfredo A.; and Cautilli, Philip A., to GAF Corporation. Glass fiber mat with improved binder. 4,258,098, Cl. 428-288.000.

Bordelon, Chester M.; and Sherwood, Richard C., to Bell Telephone Laboratories, Incorporated; and Bell Telephone Laboratories Incorporated. Electroacoustic device. 4,258,234, Cl. 179-114.00R.

Borg-Warner Corporation: *See—*
Fisher, Walter, 4,257,510, Cl. 192-106.100.
Kountz, Kenneth J.; Cooper, Kenneth W.; Abendschein, Frederic H.; and Sumner, Lee E., Jr., 4,257,238, Cl. 62-176.00B.
LaBuda, Edward F., 4,257,229, Cl. 60-330.000.

Bornian, Willem F. H., to General Electric Company. Poly(butylene terephthalate) molding resin. 4,257,929, Cl. 260-40.00R.

Boroschewski, Gerhard: *See—*
Arndt, Friedrich; and Boroschewski, Gerhard, 4,257,803, Cl. 71-100.000.

Borsodi Vegyi Kombinat: *See—*
Mariasi, Bela; Molnar, Laszlo; Toth, Janos; Gulya, Imre; Nagy, Miklos; Wolfram, Ervin; Zrinyi, Miklos; Kovacs, Gaborne; and Jaksity, Laszlone, 4,258,163, Cl. 526-202.000.

Bose, James E.: *See—*
Partin, James R.; Bose, James E.; and Ledbetter, Carl W., 4,257,239, Cl. 62-238.700.

Boswell, William C. Crankcase vacuum system. 4,257,383, Cl. 123-572.000.

Bourke, Robert F., to Gould Inc. Battery charger for electrical vehicle. 4,258,304, Cl. 320-2.000.

Bourke, Robert F.; and Johansen, David K., to Gould Inc. State of battery charge indicator circuit. 4,258,306, Cl. 320-48.000.

Bovenlander, Johannes P., to Sun Electric Europe B.V. Exhaust gas analyzer for diesel engines. 4,257,258, Cl. 73-23.000.

Bovino, Alessio A. Food ball forming apparatus. 4,257,145, Cl. 17-32.000.

Bowler, William M.: *See—*
Hosmer, William A.; and Bowler, William M., 4,258,103, Cl. 428-342.000.

Boyce, Jay, to Jay Boyce & Associates. Energy controller for conversion from a direct current source to a variable frequency load. 4,258,303, Cl. 318-811.000.

Brackmann, Richard T., to Phillips Petroleum Company. Dual molecular beam system. 4,258,257, Cl. 250-281.000.

Bradley, John S.; and Dix, Alan W., to General Electric Company. Gas turbine engine seal and method for making same. 4,257,735, Cl. 415-174.000.

Brando, Pasquale: *See—*
Rosa, Giovanni; and Brando, Pasquale, 4,257,718, Cl. 405-167.000.

Brayton, William E.; Fun, Fay; Hendrickson, Luther G.; and Shoenberger, Ronald W., to United States Steel Corporation. Apparatus for producing blast furnace coke by coal compaction. 4,257,848, Cl. 202-82.000.

Bresell, Raymond J. Cassette film type indicator for a still camera. 4,257,698, Cl. 354-289.000.

Brice, Larry D., to Westinghouse Electric Corp. Electrostatic powder coating installation. 4,257,345, Cl. 118-634.000.

Bricmont, Robert J., to H. H. Robertson Company. Method of making aluminum-base metal clad galvanized steel laminate. 4,257,549, Cl. 228-235.000.

Briddell, Brian J.: *See—*
Panken, Irving; Radow, Robert S.; and Briddell, Brian J., 4,257,329, Cl. 101-473.000.

Bridgestone Tire Company Limited: *See—*
Narumiya, Tsuneaki, 4,257,810, Cl. 106-41.000.
Narumiya, Tsuneaki, 4,258,099, Cl. 428-311.000.
Ogawa, Masaki; Araki, Tamio; and Yamamoto, Shinji, 4,257,468, Cl. 152-209.00R.
Yukuta, Toshio; Ishiwaka, Takumi; and Usui, Kiyoshi, 4,258,139, Cl. 521-110.000.

British-American Tobacco Company Limited: *See—*
Dymond, Harry F. D.; and Yallup, Albert E., 4,257,777, Cl. 23-232.00E.

British Petroleum Company Limited, The: *See—*
Hancock, Ronald D.; and Kirk, Jennie M., 4,257,916, Cl. 252-430.000.

Britton, Thomas C., to Dow Chemical Company, The. Method of foaming thermoplastic polymeric materials using tetrazole-containing heterocycles. 4,258,138, Cl. 521-90.000.

Brodie, George W., to IMI Marston Limited. Safety pressure relief apparatus. 4,257,528, Cl. 220-89.00A.

Brodsky, Jury M.: *See—*
Kudryavtsev, Boris B.; Krasnokutsky, Valentin P.; Fedotov, Lev A.; Sholk, Semen F.; Svidler, Jury R.; Zhigarev, Ivan V.; Begunov, Nikolai N.; Kostylev, Valentin F.; Brodsky, Jury M.; and Knyazev, Vadim A., 4,257,888, Cl. 210-97.000.

Broger, Emil: *See—*
Bartoldus, Dieter; and Broger, Emil, 4,258,210, Cl. 562-569.000.

Broken Hill Proprietary Company Limited, The: *See—*
Hoffman, John W., 4,257,863, Cl. 204-195.00S.

Brooks, Philip A. Line of sight display apparatus. 4,257,691, Cl. 351-158.000.

Broom, Terence W.: *See—*
Guy, Kenneth R.; Broom, Terence W.; and Maggs, Peter J., 4,257,734, Cl. 415-115.000.

Browell, Leslie J., to Plessey Handel und Investments AG. Alarm signalling systems. 4,258,357, Cl. 340-506.000.

Brown International Corporation: *See—*
Holbrook, Franklin K.; and Bushman, Ronald C., 4,257,320, Cl. 99-509.000.

Brown, Joel E.; and Overman, Kelly C., to Westinghouse Electric Corp. Phase coherent tracker of an arbitrary number of signals. 4,258,362, Cl. 343-7.300.

Brown, Manuel D. Water stop attachment and border disc. 4,257,487, Cl. 172-140.000.

Bruce, Duncan: *See*—
Conklin, Charles E.; and Bruce, Duncan, 4,258,236, Cl. 179-175.30R.

Brucken, Byron L.: *See*—
Bennett, George T.; and Brucken, Byron L., 4,257,508, Cl. 192-84.00A.

Bruhn, Alfred; and Bernard, William, to American Hydrotherm Corp. Waste heat recovery process and apparatus. 4,257,579, Cl. 266-141.000.

Brumat, Giuseppe. Implement applicable to a tractor for sucker removal, bud removal and topping of vines. 4,257,213, Cl. 56-12.700.

Brumbaugh, Lloyd E. Combined roof and solar heat structure. 4,257,400, Cl. 126-438.000.

Brunger, Wilhelm; and Mollenstedt, Gottfried, to Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten. Cathode for electron emission. 4,258,283, Cl. 313-336.000.

Brunner, Alfred, to Sulzer Brothers Limited. Hand drive for coupling to a rotatable shaft. 4,257,500, Cl. 192-35.000.

Brunswick Corporation: *See*—
Bankstahl, Herbert A., 4,257,506, Cl. 192-21.000.
Benedyk, Joseph C., 4,258,093, Cl. 428-85.000.
Benedyk, Joseph C., 4,258,094, Cl. 428-85.000.
Benedyk, Joseph C., 4,258,097, Cl. 428-224.000.

Brush, Robert W.; Werth, Dee A.; and Schildkraut, Alan L., to Bendix Corporation, The. Ball loaded anti-decoupling device for electrical connectors. 4,257,663, Cl. 339-89.00M.

Bruun & Sorensen AB: *See*—
Albertsson, Soren, 4,257,335, Cl. 110-194.000.

Bryant, Herman G., Jr.: *See*—
Collins, Peter F.; Bryant, Herman G., Jr.; and Pullman, James O., 4,257,430, Cl. 131-140.00B.

BSR Limited: *See*—
Thompson, Raymond J. T., 4,257,614, Cl. 369-267.000.

Bucalo, Louis. Method for collecting body fluids. 4,257,427, Cl. 128-769.000.

Buchmann, Hans, to Zuhlke Engineering AG. Apparatus for making holes in moving cards or the like. 4,257,291, Cl. 83-71.000.

Buchmann, Hans, to Zuhlke Engineering AG. Apparatus for preparing and processing receipts for customers of parking lots or the like. 4,257,551, Cl. 234-38.000.

Bucker, Henrique O. Preinflatable expansion device for low altitude escape or sporting parachute. 4,257,568, Cl. 244-146.000.

Budinski, John A., to General Motors Corporation. Power seat adjusting mechanism for a platform seat. 4,257,569, Cl. 248-394.000.

Buildex Incorporated: *See*—
Cook, Sanford L.; and Molisani, Justin J., 4,257,445, Cl. 137-341.000.

Buldini, Daniel A.; and Richard, Donald P., to Polaroid Corporation. Cassette for large format film unit. 4,258,263, Cl. 250-480.000.

Bulidon, Jacques: *See*—
Pavan, Charles; and Bulidon, Jacques, 4,257,976, Cl. 260-501.170.

Bunes, Leonard A.: *See*—
Wang, Patricia C.; Wingard, Robert E., Jr.; and Bunes, Leonard A., 4,258,189, Cl. 546-76.000.

Bunger, Dennen J., to Bendix Corporation, The. Engine starter and accessory drive apparatus. 4,257,281, Cl. 74-6.000.

Bunker Ramo Corporation: *See*—
Quinton, Carrol D.; and Guio, Raphael, 4,257,853, Cl. 204-32.00R.

Burd, John W.: *See*—
Ross, John M.; Gupta, Kedar P.; Kramer, Horst G.; and Burd, John W., 4,257,841, Cl. 156-620.000.

Burden, Stephen J., to General Electric Company. Molybdenum monocarbide-tungsten monocarbide solid solutions. 4,257,809, Cl. 75-203.000.

Burleigh, John E.: *See*—
Uraneck, Carl A.; and Burleigh, John E., 4,258,162, Cl. 526-173.000.

Burr, Gary D.: *See*—
Farkas, Thomas P.; and Burr, Gary D., 4,257,552, Cl. 236-1.00R.

Burrough, Donald E.; Campbell, Hallis D.; and Seefeld, Dean E., to Gehl Company. Cylindrical bale forming machine having hydraulic control means for controlling the bale density. 4,257,219, Cl. 56-341.000.

Burroughs Corporation: *See*—
Arnoldi, Douglas R.; and Todd, William H., Jr., 4,258,373, Cl. 346-154.000.

Burroughs Wellcome Co.: *See*—
Miller, Richard J.; Chang, Kwen-Jen; and Cuatrecasas, Pedro, 4,257,773, Cl. 23-230.00B.

Burton, Todd J. Portable purification device for use in aquariums. 4,257,893, Cl. 210-169.000.

Bushman, Ronald C.: *See*—
Holbrook, Franklin K.; and Bushman, Ronald C., 4,257,320, Cl. 99-509.000.

Butsuda, Takashi: *See*—
Iida, Kosuke; Morikawa, Tadayuki; Aoki, Mitsuo; Ueda, Isamu; Butsuda, Takashi; and Tsuda, Osami, 4,257,834, Cl. 156-73.600.

Byrne & Davidson Doors (N.S.W.) Pty. Limited: *See*—
Whitehouse, Martin H.; and Billows, Mitchell J., 4,257,285, Cl. 74-405.000.

Cailloux, Jean-Francois, to Essilor International "Cie Generale d'Optique". Apparatus for machining, workpieces having curved surfaces, e.g. lenses. 4,257,194, Cl. 51-57.000.

Calfo, Raymond M.; Mulach, Arthur; Fidei, Frank P.; and Minto, James G., to Westinghouse Electric Corp. Laminated flux shunt for dynamoelectric machine stator. 4,258,281, Cl. 310-256.000.

Cameo, Inc.: *See*—
Miller, Taylor C., Jr., 4,258,028, Cl. 424-49.000.

Cameron, Russell J., to Ross Operating Valve Company. Double safety valve for stamping presses and the like. 4,257,455, Cl. 137-596.160.

Campbell, Hallis D.: *See*—
Burrough, Donald E.; Campbell, Hallis D.; and Seefeld, Dean E., 4,257,219, Cl. 56-341.000.

Campbell, Kenneth J., to United States of America, Navy. Multichannel RF signal generator. 4,258,436, Cl. 375-10.000.

Campo, Louis. Instant hot air welcome mat. 4,258,248, Cl. 219-369.000.

Canon Kabushiki Kaisha: *See*—
Hirata, Noritsugu; and Takimoto, Hiroyuki, 4,257,693, Cl. 352-209.000.
Hirayama, Kazuhiro; Sato, Yasushi; Mochizuki, Noritaka; and Masaki, Katsumi, 4,257,701, Cl. 355-8.000.
Hosoe, Kazuya; Niwa, Yukichi; Tsunekawa, Tokuichi; Owada, Mitsutoshi; Asano, Noriyuki; and Masunaga, Makoto, 4,257,705, Cl. 356-1.000.
Kohayakawa, Yoshimi, 4,257,687, Cl. 351-7.000.
Magome, Tamotsu; and Saito, Takashi, 4,258,115, Cl. 430-125.000.
Matsumoto, Masakazu; and Nishide, Katsuhiko, 4,258,111, Cl. 430-2.000.
Matsumura, Isao, 4,257,688, Cl. 351-7.000.
Momiyama, Kikuo; and Yokota, Hideo, 4,257,678, Cl. 350-465.000.
Takasu, Yoshio; and Hino, Takashi, 4,258,116, Cl. 430-102.000.
Yokota, Hideo; and Tamamura, Hideo, 4,257,704, Cl. 356-8.000.

Canron Corp.: *See*—
Short, Wilbur G., 4,257,296, Cl. 83-393.000.

Cantelli, Paolo, to Fiap S.r.l. Device for neutralizing electrostatic charges. 4,258,408, Cl. 361-213.000.

Canterino, Peter J.; and Allen, Craig E., to Mobil Oil Corporation. Low density polyethylene film. 4,258,166, Cl. 526-348.100.

Capella, Eugene. Bowler's digit compression device and method. 4,257,596, Cl. 273-54.00B.

Capobianco, Salvatore A., to Combustion Engineering, Inc. Mechanism for rotating and reciprocating a soot blower. 4,257,359, Cl. 122-390.000.

Carin, Jesus R. Stepped concentric fire grate. 4,257,391, Cl. 126-163.00R.

Carl Kurt Walther GmbH & Co.: *See*—
Walther, Carl K.; and Tolle, Hans, 4,257,196, Cl. 51-163.200.

Carlin, Milton O. Anabolic recovery heating unit for small animals. 4,257,349, Cl. 119-1.000.

Carlo Erba Strumentazione S.p.A.: *See*—
Bognin, Franco; and Colombo, Bruno, 4,257,772, Cl. 23-230.0PC.

Carlsen, W. John: *See*—
Griffin, Wendell L.; Carlsen, W. John; and Benasutti, John E., 4,257,674, Cl. 350-96.210.

Carlson, Robert W. Vehicle acceleration/deceleration warning system. 4,258,353, Cl. 340-71.000.

Carmon, Amiram; Friedman, Yair; and Savin, Robert S. Portable alarm device. 4,258,354, Cl. 340-309.400.

Carpenter, Robert A., Jr., to AM International, Inc. Microfiche viewer. 4,257,180, Cl. 40-362.000.

Carrier Corporation: *See*—
Bandukwalla, Phiroze; Mount, Gordon L.; and Kirtland, Howard W., 4,257,733, Cl. 415-13.000.
Hill, M. Raymond, 4,257,617, Cl. 277-3.000.

Carrington, Orin F.: *See*—
Pyrih, Roman Z.; Rickard, Robert S.; and Carrington, Orin F., 4,258,013, Cl. 423-10.000.
Pyrih, Roman Z.; Rickard, Robert S.; and Carrington, Orin F., 4,258,014, Cl. 423-10.000.
Pyrih, Roman Z.; Rickard, Robert S.; and Carrington, Orin F., 4,258,015, Cl. 423-10.000.

Carroll, John; Dearing, Harry; Swain, Keith; and Naughton, Warren, to Blue Metal and Gravel Pty. Ltd. Method of and apparatus for drying particulate material. 4,257,168, Cl. 34-17.000.

Carson, James W. Clamping device. 4,257,583, Cl. 269-32.000.

Cartmell, James V., to NDM Corporation. X-ray transparent medical electrode. 4,257,424, Cl. 128-641.000.

Cary, John R.; Humphrey, Theodore J., II; and Wesner, Walter H., to APA Corporation, The. Universal body variable shroud dispenser. 4,257,539, Cl. 222-182.000.

Cassella Aktiengesellschaft: *See*—
Bender, Heinz; Beyerle, Rudi; Piesch, Steffen; and Martorana, Piero A., 4,258,043, Cl. 424-250.000.

Castle, Donald R.: *See*—
Chenot, Charles F.; and Castle, Donald R., 4,258,285, Cl. 313-487.000.

Casutt, Max; and Heffner, George R., to Grumman Flexible Corporation. Bus suspension mating fixture assembly. 4,257,158, Cl. 29-824.000.

Casutt, Max: *See*—
Heffner, George R.; and Casutt, Max, 4,257,150, Cl. 29-33.00K.

Caterpillar Tractor Co.: *See*—
Adams, Carl P.; and Roley, Robert D., 4,257,621, Cl. 280-495.000.
Gianessi, Albert, 4,257,647, Cl. 297-336.000.
Meisel, Thomas C., Jr.; and Stedman, Robert N., 4,257,653, Cl. 305-28.000.

Cates, Charles E.: *See—*
Franks, Virgil D., 4,257,571, Cl. 249-207.000.

Cautilli, Philip A.: *See—*
Bondoc, Alfredo A.; and Cautilli, Philip A., 4,258,098, Cl. 428-288.000.

Cecchini, Andre: *See—*
Rocroi, Jean-Pierre; and Cecchini, Andre, 4,258,322, Cl. 324-335.000.

Celanese Corporation: *See—*
Barney, Marshall, 4,257,894, Cl. 210-232.000.
Runyan, Gary L., 4,257,575, Cl. 251-292.000.
Slinkard, William E.; and Baylis, Anthony B., 4,257,921, Cl. 252-462.000.
Soehngen, John W.; and Ostrander, Kenneth, 4,257,997, Cl. 264-145.000.

Cella, James A., to General Electric Company. Methyl-tris-(4-hydroxycoumarin)silane. 4,257,957, Cl. 260-343.440.

Celler, George K.; and Seidel, Thomas E., to Bell Telephone Laboratories, Incorporated. Metallization for integrated circuits. 4,258,078, Cl. 427-43.100.

Centralny Osrodek Projektowokonstrukcyjny Maszyn Gorniczych "Komag": *See—*
Sedlaczek, Janusz; Krutki, Marian; and Olender, Kornel, 4,257,649, Cl. 299-43.000.

Centuri Engineering Co. Inc.: *See—*
Paton, Bruce L., 4,257,152, Cl. 29-281.400.

Ceskoslovenska Akadamie ved: *See—*
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,257,685, Cl. 350-358.000.

Chacour, Selim A., to Allis-Chalmers Corporation. Spherical valve seal. 4,257,574, Cl. 251-172.000.

Chakrabarti, Sarbananda: *See—*
Horacek, Heinrich; Gehm, Robert; Volkert, Otto; Chakrabarti, Sarbananda; Pauls, Mathias; and Weyland, Peter, 4,258,140, Cl. 521-114.000.

Challet, Jacques, to Constructions Electriques R.V. Fail-safe control circuit, particularly for heating apparatus. 4,258,404, Cl. 361-156.000.

Chalmers, Walter M., to Ferranti Limited. Electric connector having a plurality of in-line contacts. 4,257,660, Cl. 339-74.00R.

Chamberlain Manufacturing Corporation: *See—*
Westerman, William J., II, 4,257,402, Cl. 126-443.000.

Champion International Corporation: *See—*
Faller, Rudolph A., 4,257,530, Cl. 220-469.000.

Chance, Davey J.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,258,243, Cl. 219-69.00S.

Chandalia, Kiran B.; and Preston, Frank J., to Olin Corporation. Graft copolymers from unsaturated monomers and azo di-ester polyols and polyurethanes prepared therefrom. 4,258,148, Cl. 525-168.000.

Chang, Kwen-Jen: *See—*
Miller, Richard J.; Chang, Kwen-Jen; and Cuatrecasas, Pedro, 4,257,773, Cl. 23-230.00B.

Chappell, Walter L.; and Watts, John D. Power converter and method. 4,258,271, Cl. 290-54.000.

Chasek, Norman E. Process for improved solid fuel combustion. 4,257,338, Cl. 110-341.000.

Chazov, Evgeny I.: *See—*
Berezin, Ilia V.; Goldmakher, Viktor S.; Klibanov, Alexandr M.; Martinek, Karel; Mishin, Alexandr A.; Samokhin, Gennady P.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; and Chazov, Evgeny I., 4,257,269, Cl. 73-606.000.

Cheatham, Welford T., Jr.; and Ryan, Franklin P., Sr. Socket test device for testing three way lamp sockets. 4,258,313, Cl. 324-51.000.

Chemisch Werke Huls AG: *See—*
Schott, Ansgar; Gras, Rainer; and Wolf, Elmar, 4,258,186, Cl. 544-253.000.

Chen, Sun-Mao, to Velsicol Chemical Corporation. Process for preparing an aryl ether. 4,258,175, Cl. 528-217.000.

Cheng, Tai C.: *See—*
Schulz, Donald N.; Cheng, Tai C.; and Antkowiak, Thomas A., 4,258,173, Cl. 528-168.000.

Chenot, Charles F.; and Castle, Donald R., to GTE Products Corporation. Two-component phosphor in a cool white lamp. 4,258,285, Cl. 313-487.000.

Chester, Richard M., to Bect Chemical Co. Anti-static composition comprising a cationic surfactant, rue oil and propylene glycol. 4,257,924, Cl. 252-547.000.

Cheung, Shiu H. Television audience measuring system. 4,258,386, Cl. 358-84.000.

Chevalier, Laurent P. Plane solar energy collector with milticellular transparent cover. 4,257,403, Cl. 126-449.000.

Childers, Clifford W.; and Uber, Raymond F., to Phillips Petroleum Company. Polyphenylene ether blends. 4,258,144, Cl. 525-91.000.

Childers Products Company, Inc.: *See—*
Rieger, Martin C., 4,257,204, Cl. 52-395.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Szabo, Tibor; Institoris, Laszlo; Kovacs, Gabor; Dalmadi, Gyula; Koszegi, Bela; and Stadler, Istvan, 4,257,962, Cl. 260-346.220.

Cho, Kenneth O. Cruciate ligament surgical drill guide. 4,257,411, Cl. 128-92.0EB.

Choulet, Robert, to Societe d'Etudes et de Realisations Automobiles. Upper streamlining apparatus for the cab of a heavy transport vehicle. 4,257,643, Cl. 296-1.00S.

Christensen, Burton G.; and Ratcliffe, Ronald W., to Merck & Co., Inc. Cephalosporin compounds. 4,258,040, Cl. 424-246.000.

Christianson, David A.; Kiefer, Kevin W.; Naley, Lowell B.; Seipp, Ronald W.; Shirek, Lawrence J.; and Harrington, Robert L., to Thermo King Corporation. Container refrigeration unit. 4,257,240, Cl. 62-448.000.

Christianson, Erik F. S., to Danfoss A/S. Non-aromatic hydrocarbon containing cleaning fluid. 4,257,909, Cl. 252-170.000.

Christofer, Donald E.: *See—*
Stock, Arthur J.; and Christofer, Donald E., 4,257,518, Cl. 198-504.000.

Christophorou, Loucas G.; James, David R.; Pace, Marshall O.; and Pai, Robert Y., to United States of America, Energy. Gaseous insulators for high voltage electrical equipment. 4,257,905, Cl. 252-571.000.

Chubb & Son's Lock and Safe Co., Ltd.: *See—*
Johns-Hunt, John, 4,257,249, Cl. 70-303.00A.

Chun, Ho-Ming; and Melby, Allan L., to Henkel Corporation. Self-emulsifying cosmetic base. 4,258,063, Cl. 424-365.000.

Chupp, John P.; and Goodin, Richard D., to Monsanto Company. Process for the production of tertiary 2-haloacetamides. 4,258,196, Cl. 548-165.000.

Ciaccia, Vittorio; and Parrini, Paolo, to Montedison S.p.A. Preparing permanently embossed, highly porous wallpapers. 4,257,842, Cl. 162-117.000.

Ciba-Geigy Corporation: *See—*
Pfeifer, Josef; and Reinehr, Dieter, 4,258,176, Cl. 528-338.000.
Pfeifer, Josef, 4,258,177, Cl. 528-338.000.
Weis, Claus D.; and Sutter, Peter, 4,258,194, Cl. 546-345.000.
Zussman, Hyman W.; Knell, Martin; and Dexter, Martin, 4,258,149, Cl. 525-193.000.

Cipolli, Roberto: *See—*
DeFeo, Francesco; and Cipolli, Roberto, 4,257,942, Cl. 260-157.000.

CIR S.p.A. Divisione ASAIB: *See—*
Zini, Roberto, 4,257,562, Cl. 239-590.300.

Cities Service Company: *See—*
Levine, Ralph; and Olechowski, Jerome R., 4,258,223, Cl. 568-899.000.

Citizen Watch Co., Ltd.: *See—*
Ebihara, Heihachiro, 4,258,275, Cl. 307-511.000.
Sekiya, Fukuo; and Yamada, Takashi, 4,258,431, Cl. 368-188.000.
Suzuki, Takaharu; and Shimizu, Hiroshi, 4,257,682, Cl. 350-349.000.

Ciulla, Stephen B. Material for coating bait. 4,258,065, Cl. 426-1.000.

Clapper, Robert L.: *See—*
Hankosky, Andrew; Clapper, Robert L.; and Bake, Earl A., 4,257,714, Cl. 403-31.000.

Clarke Carrier Corporation: *See—*
Rhyan, William C., 4,257,545, Cl. 224-42.430.

Clarkson Company, The: *See—*
Clarkson, Curtis W., 4,257,447, Cl. 137-375.000.

Clarkson, Curtis W., to Clarkson Company, The. Gate valve. 4,257,447, Cl. 137-375.000.

Clasen, Rolf; and Junginger, Hans G., to U.S. Philips Corporation. Electrophotographic recording material and method of manufacturing same. 4,258,114, Cl. 430-67.000.

Claycomb, Jack R. Choke for controlling the flow of drilling mud. 4,257,442, Cl. 137-238.000.

Clements, Nicholas; and Miller, Richard L. Automatic device for washing windows. 4,257,138, Cl. 15-4.000.

Clevenger, Douglas H.: *See—*
Andress, Dale E.; and Clevenger, Douglas H., 4,257,737, Cl. 416-97.00R.

Clinton, James R., to Huntron Instruments, Inc. Stabilized output power oscillator. 4,258,337, Cl. 331-110.000.

Coal Industry (Patents) Limited: *See—*
Kellet, William H.; and Mills, Peter S., 4,257,814, Cl. 106-90.000.

Coates, John S., to Du Pont de Nemours, E. I., and Company. Purification of tetrahydrofuran. 4,257,961, Cl. 260-346.110.

Cobb, Raymond L., to Phillips Petroleum Company. Alkenylation of monovinyl aromatic polymers. 4,258,150, Cl. 525-316.000.

Coburn, Orin W.: *See—*
Hovorka, Jiri J., 4,258,279, Cl. 310-155.000.

Coca-Cola Company, The: *See—*
Coots, James C.; and Howser, Muir G., 4,257,151, Cl. 29-240.000.

Coccia, Larry A., to Pullman Incorporated. Sponge iron storage hopper having a sensor and an inert gas supply. 4,257,485, Cl. 169-61.000.

Codman & Shurtleff, Inc.: *See—*
Ryan, James P., 4,257,425, Cl. 128-758.000.

Cogliano, Joseph A., to W. R. Grace & Co. Rigidized open cell polyurethane foam. 4,258,137, Cl. 521-55.000.

Cohen, Stuart C.; and Dieck, Ronald L., to General Electric Company. Modified polyester compositions. 4,257,937, Cl. 260-40.00R.

Colby, Dwight D.: *See—*
Dougherty, William R.; van Dyke, Martin J.; and Colby, Dwight D., 4,258,422, Cl. 364-442.000.

Coles, Peter H.; and Downton, Geoffrey C., to Sperry Limited. Gyroscopes. 4,257,280, Cl. 74-5.60E.

Colgate Palmolive Company: *See—*
Wixon, Harold E., 4,257,908, Cl. 252-135.000.

Collet, Pierre D.: *See—*
Gerbal, Claude F.; Gompf, Thomas E.; and Collet, Pierre D., 4,258,120, Cl. 430-223.000.

Collins, David J.: *See—*
Barton, John E. D.; Headford, Donald W. R.; and Collins, David J., 4,257,801, Cl. 71-70.000.

Collins, Peter F.; Bryant, Herman G., Jr.; and Pullman, James O., to Liggett Group Inc. Tobacco composition including palladium. 4,257,430, Cl. 131-140.00B.

Colombo, Bruno: *See—*
Bognin, Franco; and Colombo, Bruno, 4,257,772, Cl. 23-230.0PC.

Colt Industries Operating Corp.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,258,243, Cl. 219-69.00S.

Columbus McKinnon Corporation: *See—*
Koval, Edmund R., 4,257,638, Cl. 294-82.00R.

Colville, James. Bone graft materials. 4,257,405, Cl. 128-1.00R.

Combined Logic Company: *See—*
Greenberg, George A.; and Duncan, Wayne, 4,258,385, Cl. 358-22.000.

Combustion Engineering, Inc.: *See—*
Capobianco, Salvatore A., 4,257,359, Cl. 122-390.000.
Musto, Richard L., 4,257,761, Cl. 431-174.000.

Comitato Nazionale per l'Energia Nucleare-CNEN: *See—*
Bevilacqua, Silvio; and Gislon, Renato, 4,257,823, Cl. 136-206.000.

Commissariat a l'Energie Atomique: *See—*
Bompard, Bruno, 4,257,835, Cl. 156-92.000.
Guerrini, Jacques; Berthet, Jeanne; Gaussens, Gilbert; and Lemaire, Francis, 4,258,156, Cl. 525-531.000.

Compagnie Generale de Geophysique: *See—*
Rocroi, Jean-Pierre; and Cecchini, Andre, 4,258,322, Cl. 324-335.000.

Compagnie Generale d'Electricite: *See—*
Donon, Jerome, 4,258,335, Cl. 331-94.50D.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Barbaudy, Alain; and Galaup, Jacques, 4,257,671, Cl. 350-96.150.

Compagnie Internationale pour l'Informatique Cii/Honeywell Bull (Societe Anonyme): *See—*
Lazzari, Jean-Pierre, 4,258,400, Cl. 360-103.000.

Concast Incorporated: *See—*
Tanner, Heinrich, 4,257,472, Cl. 164-70.000.

Cone, Charles N.; and Steinberg, Julius M. Method for the uniform application of foamed liquid mixtures to substrates. 4,258,088, Cl. 427-316.000.

Confinement Specialists, Inc.: *See—*
Gillette, John E.; and Mittelberg, Mark S., 4,257,354, Cl. 119-72.500.

Conforti, Frederick J., to Pittway Corporation. Electrode assembly for combustion products detector. 4,258,261, Cl. 250-381.000.

Conklin, Charles E.; and Bruce, Duncan, to Conklin Instrument Corporation. Remote telephone line switching and testing. 4,258,236, Cl. 179-175.30R.

Conklin Instrument Corporation: *See—*
Conklin, Charles E.; and Bruce, Duncan, 4,258,236, Cl. 179-175.30R.

Connaught Laboratories Limited: *See—*
Moloney, Peter J.; and Wojcik, George, 4,258,029, Cl. 424-88.000.

Conoco, Inc.: *See—*
Leach, Bruce E.; and Starks, Charles M., 4,258,220, Cl. 568-804.000.
Zielke, Clyde W.; and Bagshaw, Gary H., 4,257,873, Cl. 208-108.000.
Zielke, Clyde W.; and Rosenhoover, William A., 4,257,914, Cl. 252-415.000.

Conrey, Richard N.; McQuaid, Phillip T.; and Yursis, Paul J., to Conrey, Richard N.; and McQuaid, Phillip T. Electronic athletic equipment. 4,257,594, Cl. 273-29.00A.

Constructions Electriques R.V.: *See—*
Challet, Jacques, 4,258,404, Cl. 361-156.000.

Contraves AG: *See—*
Haller, Heinrich; and Wermelinger, Hans, 4,257,283, Cl. 74-128.000.

Cook, Norbert F.: *See—*
Wegmann, Jerome B.; and Cook, Norbert F., 4,257,540, Cl. 222-262.000.

Cook, Robert E., to A. O. Smith Corporation. Cold water inlet tube. 4,257,355, Cl. 122-17.000.

Cook, Sanford L.; and Molisani, Justin J., to Buildex Incorporated. Shielded vent port. 4,257,445, Cl. 137-341.000.

Cooper, Kenneth W.: *See—*
Kountz, Kenneth J.; Cooper, Kenneth W.; Abendschein, Frederic H.; and Sumner, Lee E., Jr., 4,257,238, Cl. 62-176.00B.

Cooper, William A. Fishing rod holder. 4,257,181, Cl. 43-21.200.

Coors Container Company: *See—*
Weits, Ferdinand; Pearce, Ronald A.; and Pennington, Norman G., 4,257,526, Cl. 215-332.000.

Coots, James C.; and Howser, Muir G., to Coca-Cola Company, The. Inspection station for beverage containers. 4,257,151, Cl. 29-240.000.

Copar Corporation: *See—*
Schmidt, Stephen R., 4,258,250, Cl. 235-92.0PE.

Copelin, Harry B., to Du Pont de Nemours, E. I., and Company. Pd/SiO_2 Hydrogenation catalyst suitable for H_2O_2 manufacture. 4,258,025, Cl. 423-588.000.

Copp, David H.: *See—*
Blahut, Donald E.; Copp, David H.; and Stanzione, Daniel C., 4,258,419, Cl. 364-200.000.

Coq B.V.: *See—*
Boersma, Rintje, 4,258,410, Cl. 361-332.000.

Coq, Francois. Device for depositing a liquid binder on a fibrous sheet for manufacturing cigarette filters. 4,257,344, Cl. 118-301.000.

Corda, Francesco: *See—*
Piccardi, Paolo; Corda, Francesco; Gozzo, Franco; and Menconi, Augusto, 4,258,202, Cl. 560-124.000.

Cornils, Boy: *See—*
Bahrmann, Helmut; Cornils, Boy; Diekhaus, Gerhard; Kascha, Waldemar; and Weber, Jurgen, 4,258,214, Cl. 568-454.000.

Cosmos Energy Innovation S.A.: *See—*
Judge, Harold R.; and Harger, Linda J., 4,258,293, Cl. 315-203.000.

Costerousse, Germain; and Teutsch, Jean G., to Roussel Uclaf. Novel epoxidation agent and process. 4,257,948, Cl. 260-239.55R.

Cottrell, Walter D., Jr.; and Jutte, Ralph B., Jr., to Owens-Corning Fiberglas Corporation. Method of obtaining interface adhesion and articles produced thereby. 4,258,106, Cl. 428-482.000.

Coulter Electronics, Inc.: *See—*
Leif, Robert C., 4,258,316, Cl. 324-71.0CP.

Coulter Systems Corporation: *See—*
Kuehnle, Manfred R., 4,258,113, Cl. 430-94.000.

Courchesne, Roger L.: *See—*
Scura, Edward D.; Kuljis, Andrew M.; and Courchesne, Roger L., 4,257,351, Cl. 119-4.000.

Cournoyer, Richard L.; and Foley, James W., to Polaroid Corporation. Novel xanthene compounds and photographic products and processes employing the same. 4,258,119, Cl. 430-221.000.

Courty, Philippe: *See—*
Sugier, Andre; Courty, Philippe; and Freund, Edouard, 4,257,920, Cl. 252-462.000.

Coutin, Pierre F.: *See—*
Hasquenoph, Jean H.; and Coutin, Pierre F., 4,257,567, Cl. 244-137.00R.

Covington, Cecil E.; Snyder, David E.; Sonneborn, Walter G.; and Cresap, Wesley L., to Textron, Inc. Soft inplane helicopter rotor. 4,257,739, Cl. 416-134.00A.

CPG Products Corp.: *See—*
Barker, David L., 4,257,188, Cl. 46-156.000.

Craig, Bryant F.: *See—*
Scott, Robert J.; and Craig, Bryant F., 4,258,291, Cl. 315-156.000.

Crasnianski, Serge, to Kis France. Multi-purpose printing machine. 4,257,323, Cl. 101-41.000.

Cremo, John J. Steam-pressured smoke eliminator for tall smoke stacks. 4,257,792, Cl. 55-230.000.

Cresap, Wesley L.: *See—*
Covington, Cecil E.; Snyder, David E.; Sonneborn, Walter G.; and Cresap, Wesley L., 4,257,739, Cl. 416-134.00A.

Cristea, Radu: *See—*
Scorteanu, Ionel R.; Spirea, Emil; and Cristea, Radu, 4,257,669, Cl. 350-6.800.

Crone, John M., Jr., to Texaco Inc. Exhaust gas treatment to reduce particulated solids. 4,257,225, Cl. 60-274.000.

Cronin, Timothy H.; Faubl, Hermann; Hoffman, William W.; and Korst, James J., to Pfizer Inc. Interferon induction in animals by amines. 4,258,061, Cl. 424-325.000.

Crosby, Edward G.; and Hornbeck, Frederick C., to Internation Business Machines Corporation. Conductive plastic with metalized glass fibers retained in partial clumps. 4,258,101, Cl. 428-371.000.

Crutchfield, Marvin M., to Monsanto Company. Method of protecting nitrilotriacetate salts. 4,257,906, Cl. 252-99.000.

Ctyroky, Jiri: *See—*
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,257,685, Cl. 350-358.000.

Cuatrecasas, Pedro: *See—*
Miller, Richard J.; Chang, Kwen-Jen; and Cuatrecasas, Pedro, 4,257,773, Cl. 23-230.00B.

Cubit Corporation: *See—*
Davis, John M., 4,257,207, Cl. 52-586.000.

Cucinella, Salvatore: *See—*
Dozzi, Giovanni; and Cucinella, Salvatore, 4,258,226, Cl. 585-270.000.

Cullen, William P.: *See—*
Sung, Rodney L.; Cullen, William P.; and Dorn, Peter, 4,257,779, Cl. 44-63.000.

Culligan International Company: *See—*
Rak, Stanley F.; and DeVale, Donald P., 4,257,887, Cl. 210-96.100.

Cummins Engine Company, Inc.: *See—*
Kasting, Edward W., 4,257,370, Cl. 123-198.00E.

Curran, Donald G.: *See—*
Anderson, Edward P.; and Curran, Donald G., 4,258,089, Cl. 427-318.000.

Cutler, Earl G.: *See—*
Presnall, Homer H., Jr.; and Cutler, Earl G., 4,257,491, Cl. 182-142.000.

Cutler, John H.: *See—*
Walker, Loren H.; and Cutler, John H., 4,258,416, Cl. 363-137.000.

Cutri, Juan M. Soccer game to be played with manually movable player pieces. 4,257,599, Cl. 273-85.00R.

Dabrowski, Ralf: *See—*
Grimm, Hans; and Dabrowski, Ralf, 4,258,074, Cl. 427-4.000.

Daenen, Theo E. G.; Oomen, Johannes M.; and Van de Berg, Joseph F. M., to U.S. Philips Corporation. Method of producing objects with a supersmooth aluminum surface. 4,257,854, Cl. 204-36.000.

Daidotokushuko: *See—*
Yoshimoto, Hiromu; Okumura, Michitoshi; and Kawate, Kenji, 4,257,829, Cl. 148-13.000.

Daimler-Benz Aktiengesellschaft: *See—*
Hanke, Hans, 4,257,504, Cl. 192-12.00A.

Dairaku, Kazuo; and Kuki, Kazuo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method and apparatus for measuring concentrations of gaseous or volatile substances in liquids. 4,257,257, Cl. 73-19.000.

Dalamangas, Chris A.; and Piccirillo, Thomas P., to Technical Wire Products, Inc. Retainer for elastomeric electrical connector. 4,257,661, Cl. 339-75.0MP.

Dalmadi, Gyula: *See*—
Szabo, Tibor; Institoris, Laszlo; Kovacs, Gabor; Dalmadi, Gyula; Koszegi, Bela; and Stadler, Istvan, 4,257,962, Cl. 260-346.220.
Damon Corporation: *See*—
Lim, Franklin, 4,257,884, Cl. 210-656.000.
Danfoss A/S: *See*—
Christianson, Erik F. S., 4,257,909, Cl. 252-170.000.
Daniels, Ronald M. Solar heat collector. 4,257,401, Cl. 126-439.000.
Dantlgraber, Jorg; Kramer, Horst; and Fischer, Horst, to G. L. Rexroth GmbH. Radial piston pump. 4,257,750, Cl. 417-270.000.
Data Packaging Corporation: *See*—
Pepicelli, Pasquale L.; and Mavilia, Robert A., 4,257,268, Cl. 73-425.600.
Yonkers, Edward H.; Stenfors, Alan; and Mathus, Gregory, 4,257,524, Cl. 211-71.000.
Daughenbaugh, Randall J., to Air Products and Chemicals, Inc. Production of carboxylic acid amides and carbamates using cobalt catalysts. 4,258,200, Cl. 560-24.000.
Dautremont-Smith, William C.: *See*—
Beni, Gerardo; Dautremont-Smith, William C.; Schiavone, Lawrence M.; and Shay, Joseph L., 4,257,856, Cl. 204-129.000.
David, Stephen T.: *See*—
Ullman, Michael K.; David, Stephen T.; and Gallian, Claude E., 4,258,027, Cl. 424-15.000.
Davidson, James P.; Rosenberg, Barnett; and Hinz, Ronald W., to Research Corporation. Method of treating viral infections. 4,258,051, Cl. 424-287.000.
Davis, John M., to Cubit Corporation. Construction system. 4,257,207, Cl. 52-586.000.
Dawes, John L., to Eastman Kodak Company. Hydroformylation process. 4,258,215, Cl. 568-454.000.
Dawson, John C. Beverage can opener. 4,257,287, Cl. 81-3.340.
De Staat der Nederlanden, Te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegraphie en Telefonie: *See*—
Matthijsse, Pieter, 4,257,673, Cl. 350-96.190.
Dearing, Harry: *See*—
Carroll, John; Dearing, Harry; Swain, Keith; and Naughton, Warren, 4,257,168, Cl. 34-17.000.
Debesis, John R.: *See*—
Potter, Ralph M.; and Debesis, John R., 4,257,765, Cl. 431-360.000.
de Brie Perry, Forbes G., to National Research Development Corporation. Damping device. 4,257,495, Cl. 188-1.00B.
Deere & Company: *See*—
Lawrence, Allan K., 4,257,566, Cl. 241-221.000.
DeFeo, Francesco; and Cipolli, Roberto, to Aziende Colori Nazionali Affini Acna S.p.A. New water-insoluble azo dyes. 4,257,942, Cl. 260-157.000.
De Groff, James T.: *See*—
Feldman, Martin L.; and De Groff, James T., 4,257,930, Cl. 260-40.00R.
Delcoigne, Adrien; and Lanneau, Jacques, to Saint Gobain Industries. Continuous process mixing of pulverized solids and liquids and mixing apparatus. 4,257,710, Cl. 366-8.000.
De Leon, Noel; Larsen, Arno I. M.; Knudsen, Poul E.; and Jensen, Erik H., to Topsil A/S. Large crystal float zone apparatus. 4,258,009, Cl. 422-250.000.
D'Elia, Robert V.: *See*—
Bartell, Jeffrey M.; and D'Elia, Robert V., 4,257,630, Cl. 285-21.000.
Dellacoletta, Brent A.: *See*—
Williams, Frank J., III; and Dellacoletta, Brent A., 4,257,953, Cl. 260-326.00R.
DeMott, Donald N.: *See*—
Kucera, Clare H.; and DeMott, Donald N., 4,257,903, Cl. 252-8.50C.
Demoute, Jean-Pierre: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,257,978, Cl. 260-544.00L.
Demuliere, Pierre; and Heins, Pierre, to U.S. Philips Corporation. Frequency synthesizer having a loop filter with a high cut-off frequency. 4,258,333, Cl. 331-11.000.
Denningmann, Elroy: *See*—
Roder, Hugh H.; Denningmann, Elroy; and Thornhill, Dewey B., 4,257,316, Cl. 493-68.000.
Deschner, Richard E. Apparatus for improved motion control. 4,257,314, Cl. 92-5.00R.
Deschner, Richard E. Hydraulic cartridge for improved motion control. 4,257,499, Cl. 188-287.000.
DeSoto, Inc.: *See*—
Sekmakas, Kazys; and Shah, Raj, 4,257,933, Cl. 260-23.00S.
DeStepheno, George E., to Le Van Specialty Co., Inc. Detachable latching device for closure panels. 4,257,632, Cl. 292-263.000.
Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Simultaneous voice pitches in a polyphonic tone synthesizer. 4,257,304, Cl. 84-1.230.
Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler: *See*—
Schmid, Josef; Lange, Ludwig; Klebe, Hans; and Schutte, Dieter, 4,258,023, Cl. 423-336.000.
DeVale, Donald P.: *See*—
Rak, Stanley F.; and DeVale, Donald P., 4,257,887, Cl. 210-96.100.
Devin, Francis: *See*—
Streichenberger, Rodolphe H., 4,257,350, Cl. 119-3.000.
Dexter, Martin: *See*—
Zussman, Hyman W.; Knell, Martin; and Dexter, Martin, 4,258,149, Cl. 525-193.000.
Diamond, George B. Plural spray pattern aerosol spray head. 4,257,560, Cl. 239-337.000.
Dickert, Joseph J., Jr.; Mitchell, Thomas O.; and Whitehurst, Darrell D., to Electric Power Research Institute. Liquefaction of acid treated coal. 4,257,869, Cl. 208-8.0LE.
Dickhudt, Eugene A.; and Zytkovicz, Duane J., to Medtronic, Inc. Stylet retainer and extension. 4,257,429, Cl. 128-786.000.
Didier Engineering GmbH: *See*—
Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, 4,258,006, Cl. 422-146.000.
Dieck, Ronald L.: *See*—
Cohen, Stuart C.; and Dieck, Ronald L., 4,257,937, Cl. 260-40.00R.
Diekhaus, Gerhard: *See*—
Bahrmann, Helmut; Cornils, Boy; Diekhaus, Gerhard; Kascha, Waldemar; and Weber, Jurgen, 4,258,214, Cl. 568-454.000.
Diepenbrock, James L., Jr.; Nelsen, M. Dean; and Harp, Marlyn F., to Boenig Company, The. Method of making a cellular core with internal septum. 4,257,998, Cl. 264-156.000.
Dierkes, Barry. Detachable motorcycle rack. 4,257,544, Cl. 224-32.00A.
Ditto, Donald R. Fireplace damper position indicator. 4,257,342, Cl. 116-307.000.
Dix, Alan W.: *See*—
Bradley, John S.; and Dix, Alan W., 4,257,735, Cl. 415-174.000.
Dobson, Michael J. Cement panel heat exchangers. 4,257,481, Cl. 165-168.000.
Dr. Ing. H.c.F. Porsch Aktiengesellschaft: *See*—
Ulrich, Johann-Georg, 4,257,375, Cl. 123-453.000.
Dr. Johannes Heidenhain GmbH: *See*—
Hiesinger, Leopold, 4,258,126, Cl. 430-324.000.
Doerges, Alexander: *See*—
Hiller, Heinz; Schlauer, Johann; Doerges, Alexander; Kempf, Georg; Svoboda, Vaclav; and Zeschmar, Winfried, 4,258,019, Cl. 423-223.000.
Dollar, Dennis V.: *See*—
Fales, Gene T.; and Dollar, Dennis V., 4,257,211, Cl. 53-442.000.
Dombroski, John R.; and Meyer, Max F., Jr., to Eastman Kodak Company. Molding compositions. 4,258,143, Cl. 525-64.000.
Dombrowski, Ferdinand; and Forster, Dieter, to Sunvic Regler GmbH. Liquid level signal transmitter. 4,258,238, Cl. 200-84.00C.
Domer, Michel; and Kriese, Eberhard, to Hutchinson-MAPA. Resilient couplings. 4,257,242, Cl. 64-14.000.
Donaldson, Gordon B., to University of Strathclyde. Apparatus for use in ordering trials. 4,258,251, Cl. 235-92.0AC.
Doncer, Alexander J., Jr.: *See*—
White, Harold R.; and Doncer, Alexander J., Jr., 4,257,900, Cl. 210-776.000.
Donn Incorporated: *See*—
Mieyal, David F., 4,257,206, Cl. 52-573.000.
Donon, Jerome, to Compagnie Generale d'Electricite. Gas laser. 4,258,335, Cl. 331-94.50D.
Dorn, Peter: *See*—
Sung, Rodney L.; Cullen, William P.; and Dorn, Peter, 4,257,779, Cl. 44-63.000.
Sung, Rodney L.; and Dorn, Peter, 4,257,780, Cl. 44-63.000.
Dougherty, William R.; van Dyke, Martin J.; and Colby, Dwight D., to Honeywell Inc. Liquid gaging system. 4,258,422, Cl. 364-442.000.
Dow Chemical Company, The: *See*—
Britton, Thomas C., 4,258,138, Cl. 521-90.000.
Jacobs, Patrick D., 4,257,820, Cl. 134-22.00R.
Kucera, Clare H.; and DeMott, Donald N., 4,257,903, Cl. 252-8.50C.
Lee, Do I.; Harry, Lawrence D.; and Morris, Jack D., 4,258,104, Cl. 428-342.000.
Morris, Earl F.; Free, Dustin L.; Root, Roland L.; and Griffin, Thomas J., Jr., 4,257,483, Cl. 166-292.000.
Orvik, Jon A., 4,257,899, Cl. 210-758.000.
Tollett, James T.; and Fletcher, Donald R., 4,258,031, Cl. 424-115.000.
Tomalia, Donald A., 4,257,970, Cl. 260-401.000.
Van Heertum, John C.; and Malhotra, Sudarshan K., 4,258,048, Cl. 424-263.000.
Downing, Stephen B., to Imperial Chemical Industries Limited. Painting device. 4,257,140, Cl. 15-230.110.
Downton, Geoffrey C.: *See*—
Coles, Peter H.; and Downton, Geoffrey C., 4,257,280, Cl. 74-5.60E.
Dozzi, Giovanni; and Cucinella, Salvatore, to Anic, S.p.A. Aromatic hydrogenation. 4,258,226, Cl. 585-270.000.
Draeger, William H.: *See*—
Lenz, Vernon C.; Draeger, William H.; and Surprenant, Ronald J., 4,258,231, Cl. 179-18.0FC.
Dressler, John L.: *See*—
Rosencwaig, Allen; Koo, Jackson C.; and Dressler, John L., 4,257,799, Cl. 65-21.400.
Drobot, Walter, to Engelhard Minerals & Chemicals Corporation. Precious metals recovery process. 4,257,807, Cl. 75-108.000.
Druschke, Frank: *See*—
Reinehr, Ulrich; and Druschke, Frank, 4,257,999, Cl. 264-203.000.
Dubauskas, Thomas A., to Lewis Engineering Company, The. Combination analog-digital indicator. 4,258,317, Cl. 324-114.000.
Dubicki, Henryk; Parsons, Jack L.; and Starks, Fred W., to United States of America, Health, Education and Welfare. Multi-step process for the production of methanesulfon-m-anisidide, 4'-(9-acridinylamino)-. 4,258,191, Cl. 546-106.000.

Dubois, Jean-Claude: *See—*
Beguin, Alain; Zann, Annie; and Dubois, Jean-Claude, 4,257,910, Cl. 252-299.000.

Duckworth, Joseph M.: *See—*
Nijhawan, Pramodh; and Duckworth, Joseph M., 4,257,849, Cl. 202-228.000.

Dudko, Daniil A.; Zverev, Anatoly I.; Astakhov, Evgeny A.; and Pulyaevsky, Georgy G. Method for coating. 4,258,091, Cl. 427-422.000.

Duez, Wayne G. Speed governing hub for windmill. 4,257,740, Cl. 416-137.000.

Duffers Associates, Inc.: *See—*
Ferguson, Hugo S.; and Raymond, Frank E., 4,257,214, Cl. 56-13.400.

Dukane Corporation: *See—*
Kawakita, Hiroaki, 4,257,730, Cl. 414-686.000.

Dunahoo, Edmond A., to Fiber Science, Inc. Continuous filament rope and method of making same. 4,257,309, Cl. 87-12.000.

Duncan, Patricia E., to Minnesota Mining and Manufacturing Company. Surgical drain. 4,257,422, Cl. 128-350.00R.

Duncan, Wayne: *See—*
Greenberg, George A.; and Duncan, Wayne, 4,258,385, Cl. 358-22.000.

Dunham-Bush, Inc.: *See—*
Shaw, David N., 4,257,795, Cl. 62-150.000.

Du Pont de Nemours, E. I., and Company: *See—*
Bergna, Horacio E., 4,257,874, Cl. 208-111.000.
Coates, John S., 4,257,961, Cl. 260-346.110.
Copelin, Harry B., 4,258,025, Cl. 423-588.000.
Eaton, David F., 4,257,915, Cl. 252-428.000.
Feiring, Andrew E., 4,258,225, Cl. 570-168.000.
Goddard, Steven J., 4,258,060, Cl. 424-322.000.
Levitt, George, 4,257,802, Cl. 71-93.000.
Matrick, Howard, 4,257,951, Cl. 260-314.500.
Middleton, William J., 4,258,187, Cl. 544-286.000.
Mrowca, Joseph J., 4,257,973, Cl. 260-410.90R.
Peterson, Marvin L., 4,257,960, Cl. 260-346.110.
Reilly, Edward L., 4,257,968, Cl. 260-396.00R.
Taggi, Arthur J., 4,258,190, Cl. 546-103.000.
Wells, Adoniram J., 4,257,746, Cl. 417-43.000.
Woods, Thomas S., 4,258,044, Cl. 424-250.000.

Duracell International Inc.: *See—*
Liang, Charles C.; and Joshi, Ashok V., 4,258,109, Cl. 429-191.000.

Durr, Frederick E.: *See—*
Murdock, Keith C.; and Durr, Frederick E., 4,258,181, Cl. 542-415.000.

Dwyer, Francis G.; and Schwartz, Albert B., to Mobil Oil Corporation. Conversion of alcohols or ethers using rare earth alumina. 4,258,218, Cl. 568-698.000.

Dykes, Willis G., to Lasco, Inc. Crop row centering. 4,257,190, Cl. 47-1.300.

Dymond, Harry F. D.; and Yallup, Albert E., to British-American Tobacco Company Limited. Gas detection. 4,257,777, Cl. 23-232.00E.

Dynamic Controls Corporation: *See—*
Farkas, Thomas P.; and Burr, Gary D., 4,257,552, Cl. 236-1.00R.

Dynapol: *See—*
Wang, Patricia C.; Wingard, Robert E., Jr.; and Bunes, Leonard A., 4,258,189, Cl. 546-76.000.

E. C. H. Will (GmbH & Co.): *See—*
Aykut, Kurt, 4,257,298, Cl. 83-482.000.
Aykut, Kurt, 4,257,299, Cl. 83-482.000.

E M I Limited: *See—*
Sloman, Anthony W., 4,257,272, Cl. 73-633.000.

E. R. Squibb & Sons, Inc.: *See—*
Varma, Ravi K., 4,257,969, Cl. 260-397.100.

Eagle Electric Mfg. Co., Inc.: *See—*
Munroe, Ronald G., 4,257,664, Cl. 339-95.00D.

Eaglemotive Industries, Inc.: *See—*
Woods, Robert L., 4,257,501, Cl. 192-58.00C.

Earth Sciences Inc.: *See—*
Pyrih, Roman Z.; Rickard, Robert S.; and Carrington, Orin F., 4,258,013, Cl. 423-10.000.
Pyrih, Roman Z.; Rickard, Robert S.; and Carrington, Orin F., 4,258,014, Cl. 423-10.000.
Pyrih, Roman Z.; Rickard, Robert S.; and Carrington, Orin F., 4,258,015, Cl. 423-10.000.

Eastman Kodak Company: *See—*
Bixby, James A.; Wright, Charles E.; and Kammerer, GilbertE., 4,258,398, Cl. 360-76.000.
Dawes, John L., 4,258,215, Cl. 568-454.000.
Dombroski, John R.; and Meyer, Max F., Jr., 4,258,143, Cl. 525-64.000.
Gerbal, Claude F.; Gompf, Thomas E.; and Collet, Pierre D., 4,258,120, Cl. 430-223.000.
Gysling, Henry J., 4,258,128, Cl. 430-413.000.
Kaukeinen, Joseph Y.; and Wright, Hal E., 4,258,112, Cl. 430-34.000.
Langworthy, Harold F., 4,257,695, Cl. 353-95.000.
Morgan, John; and Marsden, Peter D., 4,258,117, Cl. 430-214.000.
Pierce, Zona R.; and Frank, David S., 4,258,001, Cl. 422-56.000.
Schnipelsky, Paul N.; and Jakubowicz, Raymond F., 4,257,862, Cl. 204-195.00R.

Eaton, David F., to Du Pont de Nemours, E. I., and Company. Photopolymer initiator system containing a semiconductor, a reducing agent and an oxidizing agent. 4,257,915, Cl. 252-428.000.

Ebara Corporation: *See—*
Ito, Kanichi; Hirayama, Yoshio; and Kuroda, Yoshiki, 4,258,005, Cl. 422-143.000.
Watanabe, Masashi, 4,257,358, Cl. 122-235.00R.

Ebauches S.A.: *See—*
Zafferri, Roberto; and Grosjean, Laurent, 4,258,432, Cl. 368-250.000.

Eberle, John H.: *See—*
Strem, Robert C.; Strem, Richie C.; and Eberle, John H., 4,257,366, Cl. 123-554.000.

Ebihara, Heihachiro, to Citizen Watch Co., Ltd. Miniature electronic device. 4,258,275, Cl. 307-511.000.

Eccles, Edward S.: *See—*
Barnsley, Michael P.; Eccles, Edward S.; and Taylor, Ralph, 4,257,311, Cl. 91-363.00A.

Economics Laboratory, Inc.: *See—*
Lentsch, Steven E., 4,258,056, Cl. 424-303.000.

Economy, James; Flandera, Mary Ann; and Liu, Cheng-Yih, to International Business Machines Corporation. Preparation of continuous films of diacetylenic polymers. 4,258,079, Cl. 427-44.000.

Economy, James: *See—*
Balanson, Richard D.; Economy, James; Huang, Samuel J.; and Smith, Thor L., 4,258,146, Cl. 525-106.000.

Edhlund, Ronald D. Method of making hand proofs of color prints. 4,258,125, Cl. 430-293.000.

Edw. C. Levy Co.: *See—*
Hauser, Karl V., 4,257,815, Cl. 106-98.000.

Edwards, Charles R. Device for transporting materials across fragile structures. 4,257,652, Cl. 305-24.000.

Edwards, Colin W., to Hughes Microelectronics Limited. Digital to analogue converters. 4,258,355, Cl. 340-347.0DA.

Efimov, Alexei V.: *See—*
Berlin, Alfred A.; Kefeli, Tamara Y.; Varlamova, Nina V.; Strongin, Grigory M.; Altshuler, Judif M.; Kolomazov, Boris I.; and Efimov, Alexei V., 4,258,164, Cl. 526-301.000.

Ege, Sigmund, to International Standard Electric Corporation. Method and apparatus for installing a power cable or a similar elongated member between two bodies. 4,257,717, Cl. 405-154.000.

Eggert, Albert; and Schmidt, Wolfgang, to Robert Bosch GmbH. Body vibration pickup. 4,258,229, Cl. 179-1.05T.

Eggert, Heinrich: *See—*
Asp, Peter; Jarsen, Dieter; Eggert, Heinrich; and Klingelholler, Wilhelm, 4,257,838, Cl. 156-439.000.

Eguchi, Hajime; Furukawa, Hideko; Miyanishi, Toshiaki; and Sakaguchi, Makoto, to Ajinomoto Co., Inc. Mixed seasoning. 4,258,072, Cl. 426-537.000.

Eguchi, Syusaku: *See—*
Kotera, Noboru; Eguchi, Syusaku; Miyahara, Junji; Matsumoto, Seiji; and Kato, Hisatoyo, 4,258,264, Cl. 250-484.000.

Eiker, Walter M., Jr.; and Stutzman, Douglas D., to Upjohn Company, The. Onion capsule harvester and process. 4,257,216, Cl. 56-14.600.

Eisemann, Kurt, to U.S. Philips Corporation. Device for captively retaining a threaded member. 4,257,466, Cl. 411-371.000.

Eisermann, Eckehard: *See—*
Aller, Walther; Eisermann, Eckehard; Vahlhaus, Dieter; and Konig, Gerd, 4,257,542, Cl. 222-600.000.

Ejiri, Kouichi; and Sekigawa, Keiji, to Ricoh Company, Ltd. Picture processing method. 4,258,393, Cl. 358-283.000.

Electric Fuel Propulsion Corp.: *See—*
Lauve, Henry d.S., 4,257,681, Cl. 350-307.000.

Electric Power Research Institute: *See—*
Dickert, Joseph J., Jr.; Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,257,869, Cl. 208-8.0LE.
Minnick, Lawrence E., 4,257,356, Cl. 122-32.000.
Winkleblack, Robert K., 4,257,480, Cl. 165-165.000.

Electric Power Research Institute, Inc.: *See—*
Kim, Dae K.; Bertolacini, Ralph J.; Gutberlet, L. Charles; and Robinson, Ken K., 4,257,922, Cl. 252-465.000.

Electro-Voice, Incorporated: *See—*
Watson, Alan R., 4,258,235, Cl. 179-121.00D.

Electron Kilns (Luzern) GmbH, of Zahringerhof: *See—*
Pless, John H., 4,258,240, Cl. 219-10.410.

Elliott, Charles T., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Imaging devices and systems. 4,258,254, Cl. 250-211.00J.

Ellis, John D.: *See—*
Gragg, Fredrick M.; Ellis, John D.; and Adams, Allen S., 4,258,008, Cl. 422-189.000.

Ellis, Paul R., Jr., to GTE Automatic Electric Laboratories, Inc. Edge clip terminal for mounting thick film hybrid circuits in printed circuit boards. 4,257,668, Cl. 339-258.00R.

Ellison, John D. Thumb pitch compensating span gauge. 4,257,165, Cl. 33-174.00F.

Elliston, Thomas L., to Hydra-Rig, Inc. Pressure compensated spool valve. 4,257,456, Cl. 137-613.000.

Elsner, Georg; Klose, Werner; May, Christian; and Heymer, Gero, to Hoechst Aktiengesellschaft. Continuous production of phosphine. 4,258,022, Cl. 423-299.000.

El Taher, Mohamed A., to Westinghouse Electric Corp. Transportation apparatus. 4,257,515, Cl. 198-333.000.

Emerson Electric Co.: *See*—
Arnold, Harold D.; and Kitsch, Edward A., 4,258,368, Cl. 318-762.000.
Emura, Tomoyuki; and Moriuchi, Yasuhiro, to Sumitomo Bakelite Company, Limited; and Sumitomo Bakelite Company, LImited. Method for producing vinyl chloride polymers. 4,258,165, Cl. 526-321.000.
Enenkel, Hans-Joachim: *See*—
Jonas, Rochus; Becker, Karl-Heinz; Enenkel, Hans-Joachim; Minck, Klaus; and Schliep, Hans-Jochen, 4,258,062, Cl. 424-330.000.
Energy Development Associates, Inc.: *See*—
Hammond, Michael J.; and Arendell, Mark W., 4,257,867, Cl. 204-265.000.
Energy Marketing, Inc.: *See*—
Liberacki, Barry D., 4,257,393, Cl. 126-307.00A.
Enga, Bernard E., to Johnson, Matthey & Co., Limited. Engines. 4,257,223, Cl. 60-39.040.
Engelhard Minerals & Chemicals Corporation: *See*—
Drobot, Walter, 4,257,807, Cl. 75-108.000.
Mahendroo, Rajinder K., 4,257,877, Cl. 208-144.000.
Engelhardt, Edward L.; and Remy, David C., to Merck & Co., Inc. 4-Aminoaliphatic-2,3,5,6-[dibenzobicyclo[5.1.0]octanes] and salts thereof. 4,258,211, Cl. 564-379.000.
Envirotech Corporation: *See*—
Nijhawan, Pramodh; and Duckworth, Joseph M., 4,257,849, Cl. 202-228.000.
Equipment Company of America: *See*—
Thurmond, Elmer T., Jr., 4,257,471, Cl. 160-332.000.
Eriksson, Erik; and Geschwind, Lennart, to Sepson Aktiebolag. Motor vehicle winch. 4,257,577, Cl. 254-344.000.
Ersfeld, Heinrich: *See*—
Schulte, Klaus; Ersfeld, Heinrich; and Wirtz, Hans, 4,257,992, Cl. 264-45.300.
Escher, Sina D., to Firmenich SA. Substituted delta-lactones in perfume compositions. 4,257,923, Cl. 252-522.00R.
Essilor International "Cie Generale d'Optique": *See*—
Cailloux, Jean-Francois, 4,257,194, Cl. 51-57.000.
Le Naour-Sene, Lyliane, 4,257,692, Cl. 351-159.000.
Lombard, Gerard, 4,257,197, Cl. 51-168.000.
Estey Dynamics Corporation: *See*—
Porter, Donald H., 4,258,409, Cl. 361-227.000.
Eszakmagyarorszagi Vegyimu vek: *See*—
Rozsa, Laszlo; Meszaros, Lajos; and Mogyorodi, Ferenc, 4,258,010, Cl. 422-257.000.
Ethyl Products Company: *See*—
McKinney, James C., 4,257,561, Cl. 239-581.000.
Etnestad, Hermann; and Laugerud, Sverre, to O. Mustad & Son A/S. Arrangement in incinerator. 4,257,336, Cl. 110-245.000.
Eto, Akira: *See*—
Ono, Masamichi; Eto, Akira; and Yagi, Hideji, 4,257,261, Cl. 73-134.000.
Etoh, Yukihiro; Tanaka, Toshiaki; and Kunii, Kazuya, to Nissan Motor Company, Limited. Internal combustion engine exhaust passage structure. 4,257,372, Cl. 123-198.00F.
Eubanks Engineering Co.: *See*—
Patel, Jayantilal S., 4,257,295, Cl. 83-374.000.
Evans, Kenzell, Sr. Elongated exercising device of variable length. 4,257,591, Cl. 272-125.000.
Eversdijk, Bastiaan P.; and Kamphuts, Gerrit G., to Stork Friesland B.V. Method and apparatus for scrubbing a gas containing powdered particles. 4,257,785, Cl. 55-89.000.
Fakiris, John A.: *See*—
Papadofrangakis, Emmanuel; and Fakiris, John A., 4,257,278, Cl. 73-861.250.
Fales, Gene T.; and Dollar, Dennis V. Lamp packaging. 4,257,211, Cl. 53-442.000.
Faller, Rudolph A., to Champion International Corporation. Lined tray. 4,257,530, Cl. 220-469.000.
Farkas, Thomas P.; and Burr, Gary D., to Dynamic Controls Corporation. Method and apparatus for controlling the flow of a temperature regulating fluid. 4,257,552, Cl. 236-1.00R.
Farrissey, William J., Jr.; McLaughlin, Alexander; Richter, Reinhard H.; Smith, Curtis P.; and Tucker, Benjamin W., to Upjohn Company, The. Process for preparing particle board and polyisocyanate-phosphorus compound release agent composition therefor. 4,257,996, Cl. 264-122.000.
Faubl, Hermann: *See*—
Cronin, Timothy H.; Faubl, Hermann; Hoffman, William W.; and Korst, James J., 4,258,061, Cl. 424-325.000.
Faull, James K. Piercing units. 4,257,292, Cl. 83-146.000.
Favre, John A.; and Schmidt, Thomas W., to Phillips Petroleum Company. Isotope analysis. 4,258,427, Cl. 364-527.000.
Fedotov, Lev A.: *See*—
Kudryavtsev, Boris B.; Krasnokutsky, Valentin P.; Fedotov, Lev A.; Sholk, Semen F.; Svidler, Jury R.; Zhigarev, Ivan V.; Begunov, Nikolai N.; Kostylev, Valentin F.; Brodsky, Jury M.; and Knyazev, Vadim A., 4,257,888, Cl. 210-97.000.
Feinberg, Arthur L. Fire resistant fiber blend. 4,257,221, Cl. 57-256.000.
Feiring, Andrew E., to Du Pont de Nemours, E. I., and Company. TaF_5 and NbF_5 as fluorination catalysts. 4,258,225, Cl. 570-168.000.
Fel Corporation: *See*—
Snyder, Richard V., 4,258,341, Cl. 333-109.000.
Felber, Betty J.: *See*—
Lawrence, Dan D.; and Felber, Betty J., 4,257,813, Cl. 106-74.000.
Feldkamper, Richard, to Windmoller & Holscher. Method and apparatus for testing the base folds of open and finished bases formed on tube sections. 4,258,267, Cl. 250-560.000.
Feldman, Martin L.; and De Groff, James T., to Tenneco Chemicals, Inc. Thickening agents for unsaturated polyester resin compositions. 4,257,930, Cl. 260-40.00R.
Feldstein, Nathan, to Feldstein, Nathan; and Surface Technology. Dispersions for activating non-conductors for electroless plating. 4,258,087, Cl. 427-305.000.
Fenstermaker, Michael: *See*—
Valenzona, Joseph F.; and Fenstermaker, Michael, 4,258,004, Cl. 422-123.000.
Ferguson, Hugo S.; and Raymond, Frank E., to Duffers Associates, Inc. Cross flow rotary mower. 4,257,214, Cl. 56-13.400.
Ferranti Limited: *See*—
Chalmers, Walter M., 4,257,660, Cl. 339-74.00R.
Ferrero, Robert L., to Loose Leaf Metals Co., Inc. Binder assembly. 4,257,715, Cl. 402-47.000.
Feuerherd, Karl-Heinz: *See*—
Koenig, Karl-Heinz; Oeser, Heinz-Guenter; and Feuerherd, Karl-Heinz, 4,257,974, Cl. 260-453.00A.
Fiap S.r.l.: *See*—
Cantelli, Paolo, 4,258,408, Cl. 361-213.000.
Fiber Science, Inc.: *See*—
Dunahoo, Edmond A., 4,257,309, Cl. 87-12.000.
Fibiger, Richard F.: *See*—
Banks, Allen R.; Fibiger, Richard F.; and Jones, Ted, 4,258,204, Cl. 560-205.000.
Fichtel & Sachs AG: *See*—
Riese, Hans-Walter, 4,257,502, Cl. 192-70.250.
Fidei, Frank P.: *See*—
Calfo, Raymond M.; Mulach, Arthur; Fidei, Frank P.; and Minto, James G., 4,258,281, Cl. 310-256.000.
Fiedler, Heinrich: *See*—
Wygnanski, Israel; and Fiedler, Heinrich, 4,257,224, Cl. 60-204.000.
Filterwerk Mann & Hummel GmbH: *See*—
Bendig, Lothar; and Hoferer, Richard, 4,257,380, Cl. 123-552.000.
Firestone Tire & Rubber Company, The: *See*—
Beneze, Heinz W., 4,257,836, Cl. 156-125.000.
Halasa, Adel F., 4,258,160, Cl. 526-138.000.
Hergenrother, William L.; and Halasa, Adel F., 4,258,170, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., 4,258,171, Cl. 528-168.000.
Reynard, Kennard A.; and Gerber, Arthur H., 4,257,917, Cl. 252-435.000.
Schulz, Donald N.; Cheng, Tai C.; and Antkowiak, Thomas A., 4,258,173, Cl. 528-168.000.
Firmenich SA: *See*—
Escher, Sina D., 4,257,923, Cl. 252-522.00R.
Fischer, Alfred, to Tenneco Chemicals, Inc. Stable manganese salt solutions and a process for their production. 4,257,913, Cl. 252-356.000.
Fischer, Horst: *See*—
Dantlgraber, Jorg; Kramer, Horst; and Fischer, Horst, 4,257,750, Cl. 417-270.000.
Fischer, Martin; Kuesters, Werner; Penzel, Erich; Rehder, Wolfgang; and Trautmann, Walter, to BASF Aktiengesellschaft. Benzoin photoinitiator containing a quaternary ammonium group in photo curable composition and process. 4,257,859, Cl. 204-159.230.
Fishback, J. William; and Petticrew, Dennis E., to Superior Oil Company, The. Beneficiation process for oil shale. 4,257,878, Cl. 209-2.000.
Fisher, Charles R. Cartridge assembly for data-sensing system. 4,258,253, Cl. 235-439.000.
Fisher, James L. Variable ratio rotary positioning mechanism and camera dolly steering mechanism embodying same. 4,257,619, Cl. 280-91.000.
Fisher, Walter, to Borg-Warner Corporation. Non-linear spring rate clutch damper. 4,257,510, Cl. 192-106.100.
Flaherty, John, to Metal Box Limited. Resistance welding machine. 4,258,245, Cl. 219-81.000.
Flandera, Mary Ann: *See*—
Economy, James; Flandera, Mary Ann; and Liu, Cheng-Yih, 4,258,079, Cl. 427-44.000.
Flanigen, Edith M.: *See*—
Grose, Robert W.; and Flanigen, Edith M., 4,257,885, Cl. 210-691.000.
Fleischer, Leonard R.; and Gunasekaran, Muthian, to Westinghouse Electric Corp. Concrete encapsulation for spent nuclear fuel storage. 4,257,912, Cl. 252-301.10W.
Fletcher, Donald R.: *See*—
Tollett, James T.; and Fletcher, Donald R., 4,258,031, Cl. 424-115.000.
Fletcher, Paul C.; and Hildebrand, Verne E., to United States of America, Navy. Pulsed ring laser fiber gyro. 4,258,336, Cl. 331-94.50C.
Flewelling, Dale. Traction device. 4,257,410, Cl. 128-75.000.
Flex-A-Lite Products Corporation: *See*—
Willingham, Rainer O., 4,257,554, Cl. 236-35.000.
Flight Furniture Pty. Ltd.: *See*—
Jury, Harold R., 4,257,251, Cl. 72-57.000.
Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, to Thyssengas GmbH; and Didier Engineering GmbH. Apparatus for fluid catalytic conversion of gases. 4,258,006, Cl. 422-146.000.

Flory, Josef, to Weber A.G. Fabrik Elektrotechnischer Artikel und Apparate. Double-pole rocker switch with thermal protection. 4,258,349, Cl. 337-46.000.

FMC Corporation: *See—*
McRobert, Leon R., 4,257,218, Cl. 56-327.00R.

Fogarty, Raymond M. Rotary alternating piston machine with coupling lever rotating around offset crankpin. 4,257,752, Cl. 418-34.000.

Foley, James W.; Locatell, Louis, Jr.; and Zepp, Charles M., to Polaroid Corporation. Novel xanthene compounds and photographic products and processes employing the same. 4,258,118, Cl. 430-221.000.

Foley, James W.: *See—*
Cournoyer, Richard L.; and Foley, James W., 4,258,119, Cl. 430-221.000.

Folsom, Lawrence R.; Gardy, Victor R.; and Haberstroh, August J., to General Electric Company. Ammunition feeding mechanism for a gun. 4,257,310, Cl. 89-33.0CA.

Ford, Gregory A., to Phillips Petroleum Company. Continuous analysis of beverages. 4,257,259, Cl. 73-61.10C.

Forenade Fabriksverken: *See—*
Andersson, Gosta A.; Lantz, Karl-Einar; and Akhagen, Rune V., 4,257,330, Cl. 102-100.000.
Tisell, Claes-Gustav E. Y.; Lundell, Karl E. B.; Horner, Sven H. N.; Thorstensson, Gustav Y.; and Karlstedt, Gustav S. E., 4,257,315, Cl. 92-26.000.

Forestry and Forest Products Research Institute, Ministry of Agriculture, Forestry and Fisheries: *See—*
Hirabayashi, Yasuhiko; and Murayama, Toshihiro, 4,258,136, Cl. 521-25.000.

Forster, Dieter: *See—*
Dombrowski, Ferdinand; and Forster, Dieter, 4,258,238, Cl. 200-84.00C.

Fort, Pierre H. M., to Pont-A-Mousson S.A. Adjustable support for the metal supply unit for a machine for centrifugally casting pipes. 4,257,474, Cl. 164-299.000.

Foster Wheeler Energy Corporation: *See—*
Ashdown, Ronald A.; and Mannasseh, Gerald, 4,257,357, Cl. 122-235.00B.

Fournex, Robert: *See—*
Nedelec, Lucien; Torelli, Vesperto; Fournex, Robert; and Tournemine, Colette, 4,258,039, Cl. 424-241.000.

Fowler, John H. Liquid dispenser. 4,257,538, Cl. 222-181.000.

Francis, Grosvenor F.: *See—*
Maher, Jack; and Francis, Grosvenor F., 4,257,215, Cl. 56-14.400.

Frank, David S.: *See—*
Pierce, Zona R.; and Frank, David S., 4,258,001, Cl. 422-56.000.

Frankel, Manfred, to Soll Kommanditgesellschaft, Industrieschmiede. Safety brake for elevators and aerial cableways. 4,257,494, Cl. 187-89.000.

Franks, Virgil D., to Cates, Charles E., a part interest. Foundation clip assembly. 4,257,571, Cl. 249-207.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Oellerer, Friedrich, 4,257,331, Cl. 104-2.000.

Franzius, Dirk: *See—*
Wober, Wolfram; Franzius, Dirk; Andersson, Gerd; Jung, Klaus; Suess, Peter; and Wagner, Claus, 4,257,889, Cl. 210-104.000.

Frazier, Steven P., to Realex Corporation. Parts sorting mechanism. 4,257,883, Cl. 209-664.000.

Free, Dustin L.: *See—*
Morris, Earl F.; Free, Dustin L.; Root, Roland L.; and Griffin, Thomas J., Jr., 4,257,483, Cl. 166-292.000.

Freeguard, Graham F. Plastics material incorporating reclaimed tire rubber. 4,257,925, Cl. 260-2.300.

Freund, Edouard: *See—*
Sugier, Andre; Courty, Philippe; and Freund, Edouard, 4,257,920, Cl. 252-462.000.

Friedman, Yair: *See—*
Carmon, Amiram; Friedman, Yair; and Savin, Robert S., 4,258,354, Cl. 340-309.400.

Friend, David; and Kahler, Royce C., Jr., to ARP Instruments, Inc. Pressure sensitive controller for electronic musical instruments. 4,257,305, Cl. 84-1.240.

Frohlicher, Stephen G., to Liberty Carton Company. Pilfer-proof container. 4,257,550, Cl. 229-36.000.

Fromont, Jacques L., to Jeumont-Schneider. Apparatus for measuring the frequency of a pulse-generator and numerical control system using such apparatus. 4,258,300, Cl. 318-318.000.

Fronek, Donald K.: *See—*
Lane, Richard A.; and Fronek, Donald K., 4,258,423, Cl. 364-484.000.

Fuchs, Hugo: *See—*
Horn, Peter; Grosskinsky, Otto-Alfred; Thoma, Richard; and Fuchs, Hugo, 4,257,950, Cl. 260-239.30A.

Fuchs, Werner: *See—*
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,257,941, Cl. 260-152.000.

Fuji Electric Co., Ltd.: *See—*
Tanaka, Akio; Nakajima, Yoshihisa; and Yokomori, Shinji, 4,257,435, Cl. 133-3.00R.

Fuji Photo Film Co., Ltd.: *See—*
Ikenoue, Shinpei; Suzuki, Yoshiaki; and Masuda, Takao, 4,258,129, Cl. 430-620.000.
Ishibashi, Hiroshi; and Iwano, Haruhika, 4,258,127, Cl. 430-379.000.
Kojima, Teruo, 4,258,121, Cl. 430-281.000.
Kotera, Noboru; Eguchi, Syusaku; Miyahara, Junji; Matsumoto, Seiji; and Kato, Hisatoyo, 4,258,264, Cl. 250-484.000.
Nagashima, Akira; and Sato, Shigeru, 4,258,123, Cl. 430-281.000.
Uchida, Toshio; Yabuta, Yorimiti; Tachikawa, Hiromichi; and Ikeda, Teppei, 4,258,122, Cl. 430-253.000.
Yoshida, Tetsuo; Ogura, Toshiyuki; Tajiri, Shinji; and Sata, Toshio, 4,257,317, Cl. 93-40.000.

Fujii, Katsumi: *See—*
Takagahara, Isamu; Yamauti, Juniti; Yoshimura, Setsuko; Fujii, Katsumi; and Horio, Takekazu, 4,258,131, Cl. 435-26.000.

Fujii, Michinobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Coupling devices of moving blades of steam turbines. 4,257,743, Cl. 416-196.00R.

Fujii, Michinobu: *See—*
Ogata, Hisao; and Fujii, Michinobu, 4,257,742, Cl. 416-190.000.

Fujii, Setsuro; Sugimoto, Mamoru; and Yaegashi, Takashi, to Torii & Co., Ltd. Valylleucyllysine derivatives, process for producing same and method for measuring activity of enzymes using same. 4,257,940, Cl. 260-112.50R.

Fujii, Tadashiro; Nakagawa, Nobuaki; and Kotani, Kikuo, to Toyo Jozo Kabushiki Kaisha. Disulfide derivatives having S—S exchange reactivity. 4,258,193, Cl. 546-281.000.

Fujii, Takashi: *See—*
Yoshida, Keizo; Fujii, Takashi; and Kikuchi, Hiroyuki, 4,258,134, Cl. 435-201.000.

Fujii, Toshihiko, to Nissan Motor Company, Limited. Hot-press machine with facing layer carrying and setting apparatus. 4,257,840, Cl. 156-556.000.

Fujii, Yoshihisa: *See—*
Furukawa, Yasuyuki; Fujii, Yoshihisa; Tanaka, Hitoshi; and Hirota, Tetsuya, 4,258,318, Cl. 324-220.000.

Fujikawa, Tetsuzo; and Kimura, Tomoya, to Kawasaki Jukogyo Kabushiki Kaisha. Engine starting device. 4,257,367, Cl. 123-185.0BB.

Fujimori, Shigeo; Saito, Tohru; Otani, Kozaburo; and Nagatani, Taizi. Welding process for production of a steel pipe. 4,258,242, Cl. 219-61.000.

Fujimoto, Kay K., to RCA Corporation. Detector circuit with integrating feedback means. 4,258,327, Cl. 329-101.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Yoshida, Keizo; Fujii, Takashi; and Kikuchi, Hiroyuki, 4,258,134, Cl. 435-201.000.

Fujishiro, Takeshi: *See—*
Kita, Toru; Kobayashi, Hiroshi; and Fujishiro, Takeshi, 4,257,276, Cl. 73-861.220.

Fujita, Isao; Onoda, Mamoru; Kawaguchi, Fumikazu; Takenaka, Yoshimichi; and Tsutaya, Tadao, to Kobe Steel, Limited. Fired iron-ore pellets having macro pores and process for producing the same. 4,257,806, Cl. 75-3.000.

Fujita, Seigoro: *See—*
Watanabe, Noritoshi; Nakamura, Masato; and Fujita, Seigoro, 4,257,843, Cl. 162-146.000.

Fujita, Tomohiro; Iida, Kennosuke; and Kawase, Kazuo, to Akebono Brake Industry Co., Ltd. Disc brake of hydraulically operated type. 4,257,496, Cl. 188-72.600.

Fujitani, Takeo; and Matsuoka, Kajio, to Kabushiki Kaisha Kyowa. Pressure-sensitive electric conductive sheet material. 4,258,100, Cl. 428-315.000.

Fujitsu Limited: *See—*
Mori, Haruhisa; and Nakano, Motoo, 4,258,077, Cl. 427-38.000.

Fukuda, Norisuke, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for measuring the degree of rinsing. 4,257,708, Cl. 356-435.000.

Fuller, John C. Method of venting pneumatic tires and an air guide and insert tool therefor. 4,257,154, Cl. 29-432.000.

Fun, Fay: *See—*
Brayton, William E.; Fun, Fay; Hendrickson, Luther G.; and Shoenberger, Ronald W., 4,257,848, Cl. 202-82.000.

Funk, Charles R. Golfer's setup device. 4,257,608, Cl. 273-187.00R.

Furukawa, Hideko: *See—*
Eguchi, Hajime; Furukawa, Hideko; Miyanishi, Toshiaki; and Sakaguchi, Makoto, 4,258,072, Cl. 426-537.000.

Furukawa, Yasuyuki; Fujii, Yoshihisa; Tanaka, Hitoshi; and Hirota, Tetsuya, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Flaw detector for pipe employing magnets located outside the pipe and detector mounted inside and movable along the pipe with the magnets. 4,258,318, Cl. 324-220.000.

Furukawa, Yoshiyasu: *See—*
Marumoto, Ryuji; Tanabe, Masao; and Furukawa, Yoshiyasu, 4,258,033, Cl. 424-180.000.

Furuta, Yoichi: *See—*
Ohmi, Atsushi; and Furuta, Yoichi, 4,257,312, Cl. 91-369.00A.

Futakawa, Akemi: *See—*
Namura, Koji; and Futakawa, Akemi, 4,257,457, Cl. 137-851.000.

G. L. Rexroth GmbH: *See—*
Dantlgraber, Jorg; Kramer, Horst; and Fischer, Horst, 4,257,750, Cl. 417-270.000.

G. S. Blakeslee & Company: *See—*
Vilen, Erik O., 4,257,454, Cl. 137-593.000.

Ga-Vehren Engineering Company: *See—*
Ver Mehren, Hubert R., 4,257,514, Cl. 198-459.000.

Gacki, Leonard W. Portable silver recovery unit. 4,257,864, Cl. 204-213.000.

GAF Corporation: *See—*
Bondoc, Alfredo A.; and Cautilli, Philip A., 4,258,098, Cl. 428-288.000.

Gafvert, Ross J.: *See—*
Task, Harry L.; and Gafvert, Ross J., 4,257,164, Cl. 33-1.00N.

Galaup, Jacques: *See—*
Barbaudy, Alain; and Galaup, Jacques, 4,257,671, Cl. 350-96.150.

Gallian, Claude E.: *See*—
Ullman, Michael K.; David, Stephen T.; and Gallian, Claude E., 4,258,027, Cl. 424-15.000.
Gamm, Paul B.; and Strohm, Elwood, to Jung Products, Inc. Athletic protector cup. 4,257,414, Cl. 128-160.000.
Gansow, Otto A.; and Triplett, Kelly B., to Board of Trustees, Michigan State University. Lanthanide rare earth series cryptate compounds and process for the preparation of metal cryptates in general. 4,257,955, Cl. 260-338.000.
Gante, Joachim; Radunz, Hans-Eckart; Orth, Dieter; Minck, Klaus; Wild, Albrecht; and Klockow, Michael, to Merck Patent Gesellschaft mit beschrankter Haftung. Pyrazole derivatives, pharmaceutical formulations thereof. 4,258,047, Cl. 424-250.000.
Gardinier, Inc.: *See*—
Barreiro, Agustin J.; Lowe, Charles M. T.; LeFever, JoAnne; and Pyman, Ronald L., 4,258,012, Cl. 423-8.000.
Gardy, Victor R.: *See*—
Folsom, Lawrence R.; Gardy, Victor R.; and Haberstroh, August J., 4,257,310, Cl. 89-33.0CA.
Garrett Corporation, The: *See*—
Ashe, Thomas L.; and Heath, Byron B., 4,257,757, Cl. 431-7.000.
Gasson, Roy A., to Redifon Flight Simulation Limited. Apparatus for forming shaped articles. 4,257,756, Cl. 425-384.000.
Gaussens, Gilbert: *See*—
Guerrini, Jacques; Berthet, Jeanne; Gaussens, Gilbert; and Lemaire, Francis, 4,258,156, Cl. 525-531.000.
Gavit, Stephan E. Strip label printer. 4,257,328, Cl. 101-292.000.
Gazzara, Matthew R. Bow string drawing and releasing device. 4,257,386, Cl. 124-35.00A.
Gebert, Ulrich: *See*—
Kammerer, Friedrich-Johannes; Gebert, Ulrich; and Alpermann, Hans G., 4,258,046, Cl. 424-258.000.
Gebhard, Rainer; and Wagner, Hans, to Aktiebolaget Svenska Flaktfabriken. Method and apparatus for cleaning used air from spray booths wherein articles are lacquered. 4,257,784, Cl. 55-84.000.
Gehl Company: *See*—
Burrough, Donald E.; Campbell, Hallis D.; and Seefeld, Dean E., 4,257,219, Cl. 56-341.000.
Gehm, Robert: *See*—
Horacek, Heinrich; Gehm, Robert; Volkert, Otto; Chakrabarti, Sarbananda; Pauls, Mathias; and Weyland, Peter, 4,258,140, Cl. 521-114.000.
Gelfand, Dennis B., to UOP Inc. Vanadium removal from furnace gases. 4,258,017, Cl. 423-210.000.
General Atomic Company: *See*—
O'Keefe, Dennis R.; and Williamson, David G., 4,258,026, Cl. 423-648.00R.
General Electric Company: *See*—
Beers, Melvin D., 4,257,932, Cl. 260-18.00S.
Betts, Robert K.; Grisik, John J.; and Zelahy, John W., 4,257,741, Cl. 416-190.000.
Borman, Willem F. H., 4,257,929, Cl. 260-40.00R.
Bradley, John S.; and Dix, Alan W., 4,257,735, Cl. 415-174.000.
Burden, Stephen J., 4,257,809, Cl. 75-203.000.
Cella, James A., 4,257,957, Cl. 260-343.440.
Cohen, Stuart C.; and Dieck, Ronald L., 4,257,937, Cl. 260-40.00R.
Folsom, Lawrence R.; Gardy, Victor R.; and Haberstroh, August J., 4,257,310, Cl. 89-33.0CA.
Hanson, James M.; Pinkasovich, Juliana; and Sterling, Vaughn C., 4,258,412, Cl. 362-10.000.
Hetzel, Frederick, 4,258,287, Cl. 315-58.000.
Holub, Fred F.; and Mellinger, Gary A., 4,258,155, Cl. 525-431.000.
Houston, Douglas E., 4,257,156, Cl. 29-580.000.
Lupinski, John H.; and Barnes, Wilson J., 4,257,861, Cl. 204-181.00R.
Mark, Victor, 4,258,174, Cl. 528-199.000.
Papadofrangakis, Emmanuel; and Fakiris, John A., 4,257,278, Cl. 73-861.250.
Peil, William, 4,258,338, Cl. 331-111.000.
Plunkett, Allan B., 4,258,302, Cl. 318-723.000.
Potter, Ralph M.; and Debesis, John R., 4,257,765, Cl. 431-360.000.
Price, John C., 4,257,767, Cl. 432-24.000.
Smearing, Robert W., 4,258,147, Cl. 525-122.000.
Traver, Frank J.; and Raleigh, William J., 4,258,102, Cl. 428-331.000.
Walker, Loren H.; and Cutler, John H., 4,258,416, Cl. 363-137.000.
Weischedel, Richard C., 4,258,308, Cl. 323-285.000.
Williams, Frank J., III; and Dellacoletta, Brent A., 4,257,953, Cl. 260-326.00R.
Woodmansee, Donald E., 4,257,782, Cl. 48-200.000.
Woronowicz, Eric M., 4,258,428, Cl. 364-527.000.
General Mills, Inc.: *See*—
Beall, Nelson J., 4,258,086, Cl. 219-10.430.
General Motors Corporation: *See*—
Bennett, George T.; and Brucken, Byron L., 4,257,508, Cl. 192-84.00A.
Budinski, John A., 4,257,569, Cl. 248-394.000.
Lutnick, Edward T., 4,257,503, Cl. 192-3.230.
George, David: *See*—
Weisman, Irving H.; Strauss, Bernard; George, David; and Wakeley, Harold, 4,258,388, Cl. 358-100.000.
Gerbal, Claude F.; Gompf, Thomas E.; and Collet, Pierre D., to Eastman Kodak Company. Substituted sulfonamido compounds, photosensitive elements, film units, and processes for retaining a photographic image with same. 4,258,120, Cl. 430-223.000.
Gerber, Arthur H.: *See*—
Reynard, Kennard A.; and Gerber, Arthur H., 4,257,917, Cl. 252-435.000.
Gerry, Martin E. Inductive-capacitive charge-discharge ignition system. 4,258,296, Cl. 315-209.00R.
Geschwind, Lennart: *See*—
Eriksson, Erik; and Geschwind, Lennart, 4,257,577, Cl. 254-344.000.
Gestblom, Barbro; Martinsson, Christer; and Treijner, Hakan, to Junga Verkstader AB. Tumbler dryer. 4,257,170, Cl. 34-48.000.
GFM Gesellschaft fuer Fertigungstechnik und Maschinenbau Aktiengesellschaft: *See*—
Blaimschein, Gottfried; and Marzy, Otto, 4,257,724, Cl. 409-232.000.
GHT, Gesellschaft fur Hochtemperaturreaktor-Technik mbH: *See*—
Lukaszewicz, Johannes; Muller-Frank, Ulrich; and Reutler, Herbert, 4,257,845, Cl. 176-58.0PB.
Gianessi, Albert, to Caterpillar Tractor Co. Dual latch of driver's chair. 4,257,647, Cl. 297-336.000.
Gibbs, Ronald D., to Belden Corporation. Electrical connector with safety cover means. 4,257,659, Cl. 339-36.000.
Gibby, Ronald L.; Lawrence, Leo A.; Woodley, Robert E.; Wilson, Charles N.; Weber, Edward T.; and Johnson, Carl E., to United States of America, Energy. Nuclear breeder reactor fuel element with axial tandem stacking and getter. 4,257,847, Cl. 176-68.000.
Gibilisco, Kenneth J., to Merck & Co., Inc. Adjustable eyedropper-bottle holder. 4,257,417, Cl. 128-233.000.
Gilbert, Everett E.: *See*—
Ribaudo, Charles; Leccacorvi, John F.; and Gilbert, Everett E., 4,258,224, Cl. 568-935.000.
Gilcher, Heinz, to American Standard Inc. Vital voltage regulator and phase shift circuit arrangement. 4,258,312, Cl. 323-306.000.
Gilleland, Randall C.: *See*—
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,258,243, Cl. 219-69.00S.
Gillen, John D.: *See*—
Smith, Maurice I.; and Gillen, John D., 4,258,232, Cl. 179-99.00R.
Gillette, John E.; and Mittelberg, Mark S., to Confinement Specialists, Inc. Means for adjusting heights of nipple waterers. 4,257,354, Cl. 119-72.500.
Gilmour, Ian A.: *See*—
Schuurman, Hubert G.; Stott, James B.; and Gilmour, Ian A., 4,257,760, Cl. 431-158.000.
Gimaev, Nasikh Z.: *See*—
Semashko, Andrei P.; Gimaev, Nasikh Z.; Maximov, Ivan V.; Bezrukov, Sergei V.; and Rabinovich, Vladimir B., 4,257,865, Cl. 204-224.00M.
Ginger, Edward, to UOP Inc. Catalyst mixture for the catalytic reduction of nitrogen oxides in gaseous mixtures. 4,257,918, Cl. 252-440.000.
Ginger, Edward A., to UOP Inc. Process for the simultaneous separation of sulfur and nitrogen oxides from a gaseous mixture. 4,258,020, Cl. 423-239.000.
Girard, Gerald R.: *See*—
Bondinell, William E.; and Girard, Gerald R., 4,258,049, Cl. 424-258.000.
Giras, Theodore C.; and Birnbaum, Manfred E., to Westinghouse Electric Corp. System and method for operating a steam turbine and an electric power generating plant. 4,258,424, Cl. 364-494.000.
Gislon, Renato: *See*—
Bevilacqua, Silvio; and Gislon, Renato, 4,257,823, Cl. 136-206.000.
Givaudan Corporation: *See*—
Kaiser, Roman, 4,258,071, Cl. 426-536.000.
Glaser, Helmut, to Varta Batterie, A.G. Leak-proofing of button cells. 4,258,108, Cl. 429-162.000.
Glaxo Group Limited: *See*—
Humber, David C.; Laing, Stuart B.; and Weingarten, Gordon G., 4,258,183, Cl. 544-22.000.
O'Callaghan, Cynthia H.; Livermore, David G. H.; and Newall, Christopher E., 4,258,041, Cl. 424-246.000.
Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., to SmithKline Corporation. 3-Amino-2-hydroxy, halo or mercaptomethyl-4-oxoazetidines. 4,257,947, Cl. 260-239.00A.
Glenn, William E., to New York Institute of Technology. Selectable delay system. 4,257,271, Cl. 73-626.000.
Glomm, Horst M.: *See*—
Zink, John S.; Reed, Robert D.; Glomm, Horst M.; and Sawatski, Klaus E., 4,257,762, Cl. 431-177.000.
Glowinski, Albert; and Lucas, Pierre M. Bit-by-bit time-division digital switching network. 4,258,434, Cl. 370-60.000.
Gluck, Wolfgang: *See*—
Hohmann, Claus; and Gluck, Wolfgang, 4,257,520, Cl. 206-3.000.
Goddard, Steven J., to Du Pont de Nemours, E. I., and Company. Substituted trichloropropylureas as plant disease control agents. 4,258,060, Cl. 424-322.000.
Goldfarb, Adolph E. Tiltable game table with time controlled locking mechanism. 4,257,600, Cl. 273-110.000.
Goldmakher, Viktor S.: *See*—
Berezin, Ilia V.; Goldmakher, Viktor S.; Klibanov, Alexandr M.; Martinek, Karel; Mishin, Alexandr A.; Samokhin, Gennady P.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; and Chazov, Evgeny I., 4,257,269, Cl. 73-606.000.
Goldman, Steven A., to Nash Engineering Company, The. Monitoring machinery by detecting vibrations. 4,257,747, Cl. 417-63.000.

Goldmann, Wolf: *See*—
Ritzmann, Horst; Bauer, Klaus; Schmits, Heinz-Herbert; Goldmann, Wolf; and Korn, Hennig, 4,257,766, Cl. 432-14.000.

Goldstein, Gideon; and Schlesinger, David H., to Sloan-Kettering Institute for Cancer Research. Pentapeptide modified resin. 4,258,151, Cl. 525-327.000.

Goldstein, Gideon; and Schlesinger, David H., to Sloan-Kettering Institute for Cancer Research. Pentapeptide modified resin. 4,258,152, Cl. 525-327.000.

Goltner, Ewald; Lurz, Karl-Heinz; and Schneider, Gerhard, to Mo och Domsjo Aktiebolag. Suction-assisted hemorrhoid ligator. 4,257,419, Cl. 128-303.00A.

Gomez, Ernesto E. Continuous thermopile. 4,257,822, Cl. 136-206.000.

Gompf, Thomas E.: *See*—
Gerbal, Claude F.; Gompf, Thomas E.; and Collet, Pierre D., 4,258,120, Cl. 430-223.000.

Goodin, Richard D.: *See*—
Chupp, John P.; and Goodin, Richard D., 4,258,196, Cl. 548-165.000.

Goodrich, George W., to Bendix Corporation, The. Collision avoidance using optical pattern growth rate. 4,257,703, Cl. 356-4.000.

Goodyear Aerospace Corporation: *See*—
Lucas, George A., 4,257,837, Cl. 156-153.000.

Goodyear Tire & Rubber Company, The: *See*—
Bartell, Jeffrey M.; and D'Elia, Robert V., 4,257,630, Cl. 285-21.000.
Jensen, Larry W., 4,257,833, Cl. 156-64.000.
O'Mahoney, Joseph F., Jr., 4,257,934, Cl. 260-27.0BB.

Gordon Johnson Company: *See*—
Hathorn, Jack L.; and Scheier, Donald J., 4,257,142, Cl. 17-11.000.

Goricon Metallurgical Services Limited: *See*—
Thomas, William O.; and Hill, Robin, 4,257,990, Cl. 264-36.000.

Gotaverken Arendal AB: *See*—
Persbeck, Sven E., 4,257,585, Cl. 269-133.000.

Gould, Alan M.: *See*—
Allen, Robert H.; and Gould, Alan M., 4,257,627, Cl. 283-66.00R.

Gould Inc.: *See*—
Bourke, Robert F., 4,258,304, Cl. 320-2.000.
Bourke, Robert F.; and Johansen, David K., 4,258,306, Cl. 320-48.000.
Kussy, Frank W., 4,258,343, Cl. 335-6.000.

Gouyou-Beauchamps, Jacques, to Saunier Duval. Solar water heater. 4,257,397, Cl. 126-427.000.

Gozzo, Franco: *See*—
Piccardi, Paolo; Corda, Francesco; Gozzo, Franco; and Menconi, Augusto, 4,258,202, Cl. 560-124.000.

Grabel, Irwin J.; and Andersen, Glenn R., to Bally Manufacturing Corporation. In-line drop targets. 4,257,604, Cl. 273-127.00R.

Gragg, F. Michael; and Adams, Allen S., to Occidental Research Corporation; and Occidental Chemical Company. Feed system for phosphoric acid production with decreased foaming. 4,258,007, Cl. 422-189.000.

Gragg, Fredrick M.; Ellis, John D.; and Adams, Allen S., to Occidental Research Corporation; and Occidental Chemical Company. System for phosphoric acid production with decreased foaming. 4,258,008, Cl. 422-189.000.

Granzow, Albrecht H., to American Cyanamid Company. Flame retardant poly(butylene terephthalate) compositions comprising melamine pyrophosphate and a phosphonate. 4,257,931, Cl. 260-45.8NE.

Gras, Rainer: *See*—
Schott, Ansgar; Gras, Rainer; and Wolf, Elmar, 4,258,186, Cl. 544-253.000.

Grassman, Hans-Christian, to Siemens Aktiengesellschaft. Arrangement for supporting a web, especially a paper web. 4,257,167, Cl. 34-1.000.

Gray, George W.; and McDonnell, Damien G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystal materials. 4,257,911, Cl. 252-299.000.

Green, Kenneth A.: *See*—
United States of America, National Aeronautics and Space Administration; and Green, Kenneth A., 4,258,366, Cl. 343-786.000.

Green, Kieron P.; Inglis, Bruce R.; Allen, Roger A.; and Tringham, Roger W., to Wiggins Teape Limited. Fibrous material moulding apparatus. 4,257,754, Cl. 425-84.000.

Greenberg, George A.; and Duncan, Wayne, to Combined Logic Company. Interactive video production system and method. 4,258,385, Cl. 358-22.000.

Greer, Phyllis T. Color and growth enchancement of the coast of felines and canines. 4,258,036, Cl. 424-195.000.

Gresch, Heinz: *See*—
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,257,191, Cl. 47-48.500.

Greubel, Waldemar; and Quella, Ferdinand, to Siemens Aktiengesellschaft. Device for collecting light. 4,257,676, Cl. 350-96.340.

Griffin, Thomas J., Jr.: *See*—
Morris, Earl F.; Free, Dustin L.; Root, Roland L.; and Griffin, Thomas J., Jr., 4,257,483, Cl. 166-292.000.

Griffin, Wendell L.; Carlsen, W. John; and Benasutti, John E., to GTE Products Corporation. Elastomeric fiber optic splice. 4,257,674, Cl. 350-96.210.

Griffith, Denis J.; and Reddy, Scott M. Metering device for flaked and granular solids. 4,257,432, Cl. 131-173.000.

Griffith, William E., Jr., to Hedstrom Co. Pneumatic wheel and method of making same. 4,257,651, Cl. 301-58.000.

Grimm, Hans; and Dabrowski, Ralf, to Saat-und Erntetechnik GmbH. Process for the encrusting, pilling or granulating of seed material. 4,258,074, Cl. 427-4.000.

Grisik, John J.: *See*—
Betts, Robert K.; Grisik, John J.; and Zelahy, John W., 4,257,741, Cl. 416-190.000.

Groothius, William, to Project Construction Services Ltd. Portable pipe end bevelling tool. 4,257,289, Cl. 82-4.00C.

Grose, Robert W.; and Flanigen, Edith M., to Union Carbide Corporation. Novel zeolite compositions and processes for preparing and using same. 4,257,885, Cl. 210-691.000.

Grosjean, Laurent: *See*—
Zafferri, Roberto; and Grosjean, Laurent, 4,258,432, Cl. 368-250.000.

Grosskinsky, Otto-Alfred: *See*—
Horn, Peter; Grosskinsky, Otto-Alfred; Thoma, Richard; and Fuchs, Hugo, 4,257,950, Cl. 260-239.30A.

Grumman Flexible Corporation: *See*—
Casutt, Max; and Heffner, George R., 4,257,158, Cl. 29-824.000.
Heffner, George R.; and Casutt, Max, 4,257,150, Cl. 29-33.00K.

Grund, Christian: *See*—
Lemelson, Jerome H.; and Grund, Christian, 4,258,387, Cl. 358-85.000.

GSW Limited/GSW Limitee: *See*—
Woodrow, David G., 4,257,716, Cl. 405-118.000.

GTE Automatic Electric Laboratories, Inc.: *See*—
Ellis, Paul R., Jr., 4,257,668, Cl. 339-258.00R.

GTE Products Corporation: *See*—
Benasutti, John E., 4,257,546, Cl. 225-96.500.
Chenot, Charles F.; and Castle, Donald R., 4,258,285, Cl. 313-487.000.
Griffin, Wendell L.; Carlsen, W. John; and Benasutti, John E., 4,257,674, Cl. 350-96.210.

Guelen, Jean C.: *See*—
Hoffer, Jean O.; Guelen, Jean C.; Portes, Pierre J.; and Haller, Jean P., 4,258,024, Cl. 423-474.000.

Guerrini, Jacques; Berthet, Jeanne; Gaussens, Gilbert; and Lemaire, Francis, to Commissariat a l'Energie Atomique. Method of fabrication of a transparent laminated product. 4,258,156, Cl. 525-531.000.

Guio, Raphael: *See*—
Quinton, Carrol D.; and Guio, Raphael, 4,257,853, Cl. 204-32.00R.

Gulya, Imre: *See*—
Mariasi, Bela; Molnar, Laszlo; Toth, Janos; Gulya, Imre; Nagy, Miklos; Wolfram, Ervin; Zrinyi, Miklos; Kovacs, Gaborne; and Jaksity, Laszlone, 4,258,163, Cl. 526-202.000.

Gunasekaran, Muthian: *See*—
Fleischer, Leonard R.; and Gunasekaran, Muthian, 4,257,912, Cl. 252-301.10W.

Gupta, Kedar P.: *See*—
Ross, John M.; Gupta, Kedar P.; Kramer, Horst G.; and Burd, John W., 4,257,841, Cl. 156-620.000.

Guscott, John K., to American District Telegraph Company. Infrared intrusion detection system. 4,258,255, Cl. 250-221.000.

Gutberlet, L. Charles: *See*—
Kim, Dae K.; Bertolacini, Ralph J.; Gutberlet, L. Charles; and Robinson, Ken K., 4,257,922, Cl. 252-465.000.

Gutjahr, Rolf; and Bhatnagar, Satpal, to Otto Dur Anlagenbau GmbH. Method of and a device for separating paint residuals and solvents from the exhaust air of a paint spray chamber. 4,257,783, Cl. 55-61.000.

Guttentag, Anne. Mastectomy brace. 4,257,412, Cl. 128-112.000.

Guy, Kenneth R.; Broom, Terence W.; and Maggs, Peter J., to Rolls-Royce Limited. Guide vanes for gas turbine engines. 4,257,734, Cl. 415-115.000.

Gysling, Henry J., to Eastman Kodak Company. Tellurium(II) compounds and complexes having organic moieties containing silicon containing compositions, articles and photoimaging processes. 4,258,128, Cl. 430-413.000.

Gyurik, Robert J.; and Kingsbury, William D., to SmithKline Corporation. 5-Cycloalkyl thio- and oxy-2-carbalkoxyaminobenzimidazoles. 4,258,198, Cl. 548-306.000.

H. H. Robertson Company: *See*—
Bricmont, Robert J., 4,257,549, Cl. 228-235.000.

Habegger, William, to Randazza, Ronald J., a part interest. Protozoan marine life inhibitor. 4,257,352, Cl. 119-5.000.

Haberstroh, August J.: *See*—
Folsom, Lawrence R.; Gardy, Victor R.; and Haberstroh, August J., 4,257,310, Cl. 89-33.0CA.

Hackforth GmbH & Co. KG: *See*—
Moebius, Kurt O., 4,257,135, Cl. 7-125.000.

Hackler, Erich: *See*—
Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, 4,258,006, Cl. 422-146.000.

Hagiwara, Seisaku; and Matsuura, Fumio, to Nihon Kohden Kogyo Co., Ltd. Pen recorder for enabling a recording pen to record characters. 4,258,369, Cl. 346-62.000.

Hahnle, Reinhard, to Hoechst Aktiengesellschaft. Disperse azo dyestuffs and process for preparation and their use. 4,257,943, Cl. 260-207.000.

Halasa, Adel F., to Firestone Tire & Rubber Company, The. Process for polymerizing butadiene. 4,258,160, Cl. 526-138.000.

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Hergenrother, William L.; and Halasa, Adel F., 4,258,170, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., 4,258,171, Cl. 528-168.000.

Halcon Research and Development Corp.: *See*—
Moy, David, 4,258,201, Cl. 560-24.000.
Hall, Sture R.: *See*—
Mickelsson, Seve-Mikael; and Hall, Sture R., 4,257,340, Cl. 111-1.000.
Haller, Heinrich; and Wermelinger, Hans, to Contraves AG. Stepping mechanism for a multi-position switch. 4,257,283, Cl. 74-128.000.
Haller, Jean P.: *See*—
Hoffer, Jean O.; Guelen, Jean C.; Portes, Pierre J.; and Haller, Jean P., 4,258,024, Cl. 423-474.000.
Hamada, Hiroshi: *See*—
Kuwagaki, Hiroshi; Hamada, Hiroshi; Takechi, Sadatoshi; and Yano, Kohzo, 4,257,683, Cl. 350-357.000.
Hamm, Thomas: *See*—
Regnault, Alain; Sachetto, Jean-Pierre; Tournier, Herve; Hamm, Thomas; and Armanet, Jean-Michel, 4,257,818, Cl. 127-1.000.
Hammar, Walton J.; and Rustad, Mark A., to Riker Laboratories, Inc. Derivatives of 2-nitrobenzofuran. 4,258,213, Cl. 568-331.000.
Hammond, Daniel L.; and Jeffries, Philip G. Cable shield connector assembly. 4,257,658, Cl. 339-14.00R.
Hammond, Michael J.; and Arendell, Mark W., to Energy Development Associates, Inc. Inert gas rejection device for zinc-halogen battery systems. 4,257,867, Cl. 204-265.000.
Hancock, Ronald D.; and Kirk, Jennie M., to British Petroleum Company Limited, The. Process for the preparation of a functionalized solid product. 4,257,916, Cl. 252-430.000.
Hanke, Hans, to Daimler-Benz Aktiengesellschaft. Hydrodynamic retarder for vehicles, especially for motor vehicles. 4,257,504, Cl. 192-12.00A.
Hankosky, Andrew; Clapper, Robert L.; and Bake, Earl A., to Rockwell International Corporation. Device for coupling a pair of rods. 4,257,714, Cl. 403-31.000.
Hanotier, Jacques D. V., to Labofina S.A. Process for preparing terephthalic acid. 4,258,209, Cl. 562-412.000.
Hansen, Kenneth N., to Allis-Chalmers Corporation. Extendible steering column. 4,257,624, Cl. 280-775.000.
Hansen, LaVelle H.: *See*—
Snyder, Larry L.; and Hansen, LaVelle H., 4,257,527, Cl. 220-72.000.
Hanson, James M.; Pinkasovich, Juliana; and Sterling, Vaughn C., to General Electric Company. Flash lamp array having improved reflector and barrier member. 4,258,412, Cl. 362-10.000.
Harada, Yasukazu: *See*—
Sasaki, Koji; and Harada, Yasukazu, 4,258,030, Cl. 424-94.000.
Harbridge, John B., to Beecham Group Limited. Antibacterial agents. 4,258,050, Cl. 424-272.000.
Harding, Geoffrey, to U.S. Philips Corporation. Device for examining a body by means of penetrating radiation. 4,258,256, Cl. 250-272.000.
Harding, Larry R. Hoop and adjustable target game. 4,257,603, Cl. 273-126.00R.
Harger, Linda J.: *See*—
Judge, Harold R.; and Harger, Linda J., 4,258,293, Cl. 315-203.000.
Harp, Marlyn F.: *See*—
Diepenbrock, James L., Jr.; Nelsen, M. Dean; and Harp, Marlyn F., 4,257,998, Cl. 264-156.000.
Harrington, Robert L.: *See*—
Christiansen, David A.; Kiefer, Kevin W.; Naley, Lowell B.; Seipp, Ronald W.; Shirek, Lawrence J.; and Harrington, Robert L., 4,257,240, Cl. 62-448.000.
Harris, James M., to National Semiconductor Corporation. Expanded pad structure. 4,258,382, Cl. 357-71.000.
Harris, Paul J.: *See*—
Allcock, Harry R.; and Harris, Paul J., 4,258,172, Cl. 528-168.000.
Harrison, Stuart A., to Henkel Corporation. Monotertiarymonosecondarydiprimarytetramine and monotertiarymonosecondarydinitrilodiamines. 4,257,984, Cl. 564-336.000.
Harry, Lawrence D.: *See*—
Lee, Do I.; Harry, Lawrence D.; and Morris, Jack D., 4,258,104, Cl. 428-342.000.
Hartmann, Werner; Kutz, Johannes; and Itgenshorst, Dieter, to Kusters, Eduard. Arrangement for the continuous treatment, particularly washing, of textile materials. 4,257,246, Cl. 68-200.000.
Hartney, Robert W.: *See*—
Leblanc, Raymond F.; Taylor, Donald M.; and Hartney, Robert W., 4,257,994, Cl. 264-102.000.
Hartung, Donald E.; and Siegel, Arnold L., to Scholl, Inc. Insole with material released under foot loads. 4,257,176, Cl. 36-44.000.
Hartwell Corporation: *See*—
Anderson, John P., 4,257,677, Cl. 350-174.000.
Haruna, Tohru: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,257,927, Cl. 260-23.0XA.
Hasegawa, Katsundo, to Owens-Illinois, Inc. Decorative air bubble formation in glassware. 4,257,800, Cl. 65-221.000.
Hasquenoph, Jean H.; and Coutin, Pierre F., to R. Alkan & Cie. Retractable gripping-arm device for transporting and jettisoning ringless loads carried under aircraft. 4,257,567, Cl. 244-137.00R.
Hassan, Javathu K.; and Paivanas, John A., to International Business Machines Corporation. Contactless air film lifting device. 4,257,637, Cl. 294-64.00B.
Hasuo, Masayoshi: *See*—
Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; Kitada, Hisashi; and Uehara, Yumito, 4,258,161, Cl. 526-153.000.
Hatanaka, Takefumi, to Lifewell Corporation. Desk-top shredder. 4,257,565, Cl. 241-100.000.
Hatebur Umformmaschinen AG: *See*—
Zanzerl, Hermann, 4,257,253, Cl. 72-345.000.
Hater, Martin: *See*—
Meurer, Peter; Hater, Martin; Meininghaus, Fritz; and Scheel, Rudiger, 4,257,898, Cl. 210-751.000.
Hathorn, Jack L.; and Scheier, Donald J., to Gordon Johnson Company. Opening apparatus for poultry carcasses. 4,257,142, Cl. 17-11.000.
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Kawata, Hiroitsu; Ohmura, Tadayoshi; Shiozawa, Hiroyoshi; and Hattori, Munetaka, 4,258,179, Cl. 536-95.000.
Hauser, Karl V., to Edw. C. Levy Co. Air entraining mortar and process of manufacture. 4,257,815, Cl. 106-98.000.
Havens, Jeffrey G. Wrapping apparatus and method. 4,257,212, Cl. 53-463.000.
Hayden, Robert E., Sr., to Potters Industries, Inc. Method of reducing fuel consumption by peening. 4,258,084, Cl. 427-239.000.
Haynes, Harvey H. System for placement of piles into the seafloor. 4,257,721, Cl. 405-227.000.
Hazen Research, Inc.: *See*—
Kindig, James K.; and Turner, Ronald L., 4,257,881, Cl. 75-1.00R.
Stephens, Frank M., Jr., 4,257,781, Cl. 48-197.00R.
Headford, Donald W. R.: *See*—
Barton, John E. D.; Headford, Donald W. R.; and Collins, David J., 4,257,801, Cl. 71-70.000.
Health Development Corporation: *See*—
Beal, Charles B., 4,257,421, Cl. 128-348.000.
Heath, Byron B.: *See*—
Ashe, Thomas L.; and Heath, Byron B., 4,257,757, Cl. 431-7.000.
Heath, Chester A., to International Business Machines Corporation. Variable capacity data buffer system. 4,258,418, Cl. 364-200.000.
Hedstrom Co.: *See*—
Griffith, William E., Jr., 4,257,651, Cl. 301-58.000.
Heffner, George R.; and Casutt, Max, to Grumman Flexible Corporation. Apparatus for assembling wall modules from a pair of stretched sheets of metal laterally spaced apart by a skeletal frame. 4,257,150, Cl. 29-33.00K.
Heffner, George R.: *See*—
Casutt, Max; and Heffner, George R., 4,257,158, Cl. 29-824.000.
Heimbrand, Eberhard, to Ledermann & Co. Saw tool. 4,257,302, Cl. 83-839.000.
Heins, Pierre: *See*—
Demuliere, Pierre; and Heins, Pierre, 4,258,333, Cl. 331-11.000.
Heiser, Arlan H.: *See*—
Adamus, Ronald A.; and Heiser, Arlan H., 4,257,254, Cl. 72-432.000.
Helena Laboratories Corporation: *See*—
Mostyn, William T., Jr., 4,257,709, Cl. 356-435.000.
Heller, Herbert; and Schmitt, Paul W., to Mine Safety Appliances Company. Party line telephone system. 4,258,230, Cl. 179-17.00A.
Hendricks, Charles D.; Koo, Jackson C.; and Rosencwaig, Allan, to United States of America, Energy. Method for introduction of gases into microspheres. 4,257,798, Cl. 65-21.400.
Hendricks, Charles D., to United States of America, Energy. Cryogenic target formation using cold gas jets. 4,258,075, Cl. 427-6.000.
Hendrickson, Luther G.: *See*—
Brayton, William E.; Fun, Fay; Hendrickson, Luther G.; and Shoenberger, Ronald W., 4,257,848, Cl. 202-82.000.
Hendrix Wire & Cable Corp.: *See*—
Jean, Leonard P.; and La Chance, Ernest J., Sr., 4,258,228, Cl. 174-168.000.
Henkel Corporation: *See*—
Chun, Ho-Ming; and Melby, Allan L., 4,258,063, Cl. 424-365.000.
Harrison, Stuart A., 4,257,984, Cl. 564-336.000.
Henningsen Foods, Inc.: *See*—
Bergquist, Dwight H.; and Lorimor, Gary D., 4,257,790, Cl. 55-379.000.
Henrich, Hans, to J.M. Voith GmbH. Apparatus and process for producing wood pulp in a pressurized wood grinder. 4,257,563, Cl. 241-17.000.
Henrich, Robert S., to Bendix Corporation, The. Signal conditioning circuit for magnetic sensing means. 4,258,324, Cl. 324-392.000.
Hensley, Clifford A.; and Adams, Keith G. Cotton module tarpaulin pin. 4,257,200, Cl. 52-4.000.
Hensley, Richard K. Toy hoop guide rod. 4,257,189, Cl. 46-241.000.
Hensy, Philip E.: *See*—
Kronman, Albert F.; and Hensy, Philip E., 4,257,696, Cl. 354-14.000.
Herchenbach, Paul, to Jean Walterschied GmbH. Homokinetic double joint for wide bending angles. 4,257,243, Cl. 64-17.00R.
Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing pyrazole or imidazole substituents. 4,258,170, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing substituted alkyl/cycloalkyl substituents. 4,258,171, Cl. 528-168.000.
Herman, Irving P.: *See*—
Marling, John B.; and Herman, Irving P., 4,257,860, Cl. 204-163.00R.
Herman Miller, Inc.: *See*—
Propst, Robert L.; Wodka, Michael A.; and Newhouse, Thomas J., 4,257,203, Cl. 52-221.000.
Herrgen, Rudolf, to Werkzeug-Union GmbH-DWU. Torque wrench. 4,257,263, Cl. 73-139.000.

Herschtal, Ludwik; and Zelenka, Alfred, to L M Ericsson Pty. Ltd. Digital data communication network having differing data transmission rate capabilities. 4,258,433, Cl. 370-24.000.

Hesse, Ruth L.: *See*—
Kohnke, Ole B., 4,257,453, Cl. 137-514.300.

Hessner, Hans, to Mo och Domsjo Aktiebolag. Device for absorbing urine with incontinent persons. 4,257,418, Cl. 128-286.000.

Hetzel, Frederick, to General Electric Company. Circular fluorescent lamp unit. 4,258,287, Cl. 315-58.000.

Hewinson, Vincent K.: *See*—
Pollock, James F.; Linger, Keith R.; and Hewinson, Vincent K., 4,257,157, Cl. 29-611.000.

Heymer, Gero: *See*—
Elsner, Georg; Klose, Werner; May, Christian; and Heymer, Gero, 4,258,022, Cl. 423-299.000.

Hickling, Nelson F., to John-Nelson Corporation. Carburetor. 4,257,379, Cl. 123-518.000.

Hiesinger, Leopold, to Dr. Johannes Heidenhain GmbH. High resolution recording medium and method for producing same. 4,258,126, Cl. 430-324.000.

Hijikata, Akiko: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,258,192, Cl. 546-166.000.

Hilburn, Hugh C.; and Spilsbury, Thomas W., to Sperry Corporation. Dynamic focus control and power supply for cathode ray tube displays. 4,258,298, Cl. 315-382.000.

Hildebrand, Verne E.: *See*—
Fletcher, Paul C.; and Hildebrand, Verne E., 4,258,336, Cl. 331-94.50C.

Hill, Donald C.; and Lyall, Robert W., to R. W. Lyall & Co., Inc. Biased open direct response valve with damping means. 4,257,452, Cl. 137-514.700.

Hill, M. Raymond, to Carrier Corporation. Shaft seal assembly. 4,257,617, Cl. 277-3.000.

Hill, Robert M.: *See*—
McCusker, Michael V.; Lorents, Donald C.; Hill, Robert M.; and Huestis, Davis L., 4,258,334, Cl. 331-94.50G.

Hill, Robin: *See*—
Thomas, William O.; and Hill, Robin, 4,257,990, Cl. 264-36.000.

Hiller, Heinz; Schlauer, Johann; Doerges, Alexander; Kempf, Georg; Svoboda, Vaclav; and Zeschmar, Winfried, to Metallgesellschaft Aktiengesellschaft. Process of regenerating alkali carbonate solutions formed by the desulfurization of hot gases. 4,258,019, Cl. 423-223.000.

Hilmar, Shaun K., to American Can Company. Laminate structure for collapsible dispensing container. 4,257,536, Cl. 222-107.000.

Hino, Takashi: *See*—
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Hinz, Ronald W.: *See*—
Davidson, James P.; Rosenberg, Barnett; and Hinz, Ronald W., 4,258,051, Cl. 424-287.000.

Hipp, Steven J.; and Wilde, Richard C., to Rite-Hite Corporation. Dock leveler. 4,257,137, Cl. 14-71.300.

Hirabayashi, Nobuhiro, to Shin-Shirasuna Electric Corp. Tape transport mechanism. 4,257,547, Cl. 226-110.000.

Hirabayashi, Yasuhiko; and Murayama, Toshihiro, to Forestry and Forest Products Research Institute, Ministry of Agriculture, Forestry and Fisheries. Process for producing wood adsorbents for mercury ions by graft polymerization of acrolein onto xanthated wood meal followed by conversion to thiosemicarbazone. 4,258,136, Cl. 521-25.000.

Hiraiwa, Kazuyoshi; and Takahashi, Kotei, to Nissan Motor Company, Limited. Hydraulic clutch with dual pistons. 4,257,509, Cl. 192-86.000.

Hirano, Tomoyuki: *See*—
Watanabe, Mitsugu; and Hirano, Tomoyuki, 4,258,076, Cl. 427-14.100.

Hirao, Yasuhiko: *See*—
Abe, Kenji; Tsuge, Ayao; Hirao, Yasuhiko; Hori, Keiichi; and Isono, Masamichi, 4,257,819, Cl. 134-19.000.

Hirata, Noritsugu; and Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Cine camera. 4,257,693, Cl. 352-209.000.

Hirata, Seizi: *See*—
Matsuyama, Kiyoshi; Ishikawa, Shozi; Hirata, Seizi; and Ogura, Tsutomu, 4,257,533, Cl. 222-1.000.

Hirata, Yoshimutsu. Nonlinear distortion measurement using composite pulse waveform. 4,258,314, Cl. 324-57.00R.

Hirayama, Kazuhiro; Sato, Yasushi; Mochizuki, Noritaka; and Masaki, Katsumi, to Canon Kabushiki Kaisha. Image information recording apparatus. 4,257,701, Cl. 355-8.000.

Hirayama, Yoshio: *See*—
Ito, Kanichi; Hirayama, Yoshio; and Kuroda, Yoshiki, 4,258,005, Cl. 422-143.000.

Hirose, Isamu: *See*—
Kyo, Kayomon; Asahara, Nakaba; Asai, Yasuhiko; Hirose, Isamu; and Kato, Sadao, 4,258,154, Cl. 525-425.000.

Hirota, Tetsuya: *See*—
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Hitachi, Ltd.: *See*—
Iijima, Kazunori; Honma, Kazuo; Terayama, Takao; Yoshida, Masashi; Kawase, Hideyuki; and Miyakawa, Seii, 4,258,399, Cl. 360-85.000.
Kaneko, Kenji; Okabe, Takahiro; Nakamura, Tohru; Takasugi, Wasao; and Nagata, Minoru, 4,258,330, Cl. 330-257.000.

Miyata, Kenji; Kamei, Tatsuya; and Okamura, Masahiro, 4,258,377, Cl. 357-38.000.
Seki, Kunio, 4,258,406, Cl. 361-79.000.
Shimada, Satoshi; Kawakami, Kanji; and Nishihara, Motohisa, 4,257,274, Cl. 73-718.000.
Watanabe, Tomoyuki; Okabe, Takahiro; Nagata, Minoru; Nakamura, Tohru; Kaneko, Kenji; Okada, Yutaka; Anzai, Norio; Nishimura, Takanori; and Agatsuma, Takashi, 4,258,379, Cl. 357-44.000.

Hivolin GmbH: *See*—
Marx, Joachim, 4,257,279, Cl. 73-861.570.

Hobbs, Oliver K. Multiple row harvester for peanut crops. 4,257,486, Cl. 171-101.000.

Hockham, George A.; and Wolfson, Ronald I., to International Telephone and Telegraph Corporation. Around-the-mast rotary annular antenna feed coupler. 4,258,365, Cl. 343-763.000.

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Bartmann, Wilhelm; Beck, Gerhard; Reuschling, Dieter-Bernd; Seeger, Karl; and Teufel, Hermann, 4,258,053, Cl. 424-275.000.
Bartmann, Wilhelm; Beck, Gerhard; Lerch, Ulrich; and Bickel, Martin, 4,258,057, Cl. 424-305.000.
Elsner, Georg; Klose, Werner; May, Christian; and Heymer, Gero, 4,258,022, Cl. 423-299.000.
Hahnle, Reinhard, 4,257,943, Cl. 260-207.000.
Kammerer, Friedrich-Johannes; Gebert, Ulrich; and Alpermann, Hans G., 4,258,046, Cl. 424-258.000.
Kleber, Rolf; Panke, Hans L.; and Hoffmann, Erich, 4,257,769, Cl. 8-188.000.
Prohaska, Peter, 4,257,348, Cl. 118-689.000.
Rechmeier, Gerhard; Roesnik, Ulrich; and Scholz, Harald, 4,257,850, Cl. 203-29.000.

Hoenisch, Walter H., to King-Seeley Thermos Co. Electrical control circuit for ice making machine. 4,257,237, Cl. 62-157.000.

Hoerauf, Werner; and Valentin, Guenter, to BASF Aktiengesellschaft. Discharging granular linear polycondensates. 4,258,178, Cl. 528-502.000.

Hofbauer, Peter, to Volkswagenwerk Aktiengesellschaft. Sound insulated internal combustion engine. 4,257,368, Cl. 123-195.00C.

Hoferer, Richard: *See*—
Bendig, Lothar; and Hoferer, Richard, 4,257,380, Cl. 123-552.000.

Hoffer, Jean O.; Guelen, Jean C.; Portes, Pierre J.; and Haller, Jean P., to Potasse et Produits Chimiques. Non-pollutant process for the manufacture of neutral calcium hypochlorite with a high content of active chlorine. 4,258,024, Cl. 423-474.000.

Hoffman, John W., to Broken Hill Proprietary Company Limited, The. Gas sensors and method of making such sensors. 4,257,863, Cl. 204-195.00S.

Hoffman, William W.: *See*—
Cronin, Timothy H.; Faubl, Hermann; Hoffman, William W.; and Korst, James J., 4,258,061, Cl. 424-325.000.

Hoffmann, Erich: *See*—
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Hoffmann-La Roche Inc.: *See*—
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Walser, Armin, 4,257,946, Cl. 260-239.0BD.

Hohmann, Claus; and Gluck, Wolfgang, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Integral ammunition bunker. 4,257,520, Cl. 206-3.000.

Holbrook, Franklin K.; and Bushman, Ronald C., to Brown International Corporation. Whole fruit peel oil extractor. 4,257,320, Cl. 99-509.000.

Holden, Kenneth G.: *See*—
Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., 4,257,947, Cl. 260-239.00A.

Hollandse Signaalapparaten B.V.: *See*—
Bodmer, Maximiliaan H.; Hoogstraate, Hendrik; and Van Rooyen, Gerrit, 4,258,363, Cl. 343-16.00R.

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Vaughn, George L.; and Hollingsworth, John D., 4,257,148, Cl. 19-98.000.

Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, to Industrie-Wert Beteiligungsgesellschaft mbH. Moisture reservoir for fertile soils for plants. 4,257,191, Cl. 47-48.500.

Holub, Fred F.; and Mellinger, Gary A., to General Electric Company. Blends of polyetherimides and polyamideimides. 4,258,155, Cl. 525-431.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Sato, Toshihiko; Ishida, Yoichi; and Iwashita, Kanau, 4,257,227, Cl. 60-290.000.

Honeywell Inc.: *See*—
Dougherty, William R.; van Dyke, Martin J.; and Colby, Dwight D., 4,258,422, Cl. 364-442.000.
Miles, Gregory M., 4,257,759, Cl. 431-31.000.

Honeywell Information Systems Inc.: *See*—
Negi, Virendra S.; and Peters, Arthur, 4,258,420, Cl. 364-200.000.

Hong, Paul O., to B. F. Goodrich Company, The. Inversion polymerization process for producing vinyl resins using coated reactors. 4,258,157, Cl. 526-62.000.

Honma, Kazuo: *See*—
Iijima, Kazunori; Honma, Kazuo; Terayama, Takao; Yoshida, Masashi; Kawase, Hideyuki; and Miyakawa, Seii, 4,258,399, Cl. 360-85.000.

Hoogstraate, Hendrik: *See*—
Bodmer, Maximiliaan H.; Hoogstraate, Hendrik; and Van Rooyen, Gerrit, 4,258,363, Cl. 343-16.00R.

Hooker, Donald E., to Bally Manufacturing Corporation. Coin acceptor apparatus. 4,257,512, Cl. 194-100.00A.
Horacek, Heinrich; Gehm, Robert; Volkert, Otto; Chakrabarti, Sarbananda; Pauls, Mathias; and Weyland, Peter, to BASF Aktiengesellschaft. Storage-stable prepolymers sprayable from a pressure vessel. 4,258,140, Cl. 521-114.000.
Hori, Keiichi: *See*—
Abe, Kenji; Tsuge, Ayao; Hirao, Yasuhiko; Hori, Keiichi; and Isono, Masamichi, 4,257,819, Cl. 134-19.000.
Horio, Takekazu: *See*—
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Horiuchi, Hiroshi: *See*—
Tanimura, Shozo; Saito, Yasuhisa; Horiuchi, Hiroshi; Mieno, Kazunori; Nakao, Shinji; Nakano, Takaaki; and Kamei, Kenzo, 4,257,926, Cl. 260-3.000.
Horn, Peter; Grosskinsky, Otto-Alfred; Thoma, Richard; and Fuchs, Hugo, to BASF Aktiengesellschaft. Continuous preparation of ε-caprolactam by Beckmann rearrangement. 4,257,950, Cl. 260-239.30A.
Hornbeck, Frederick C.: *See*—
Crosby, Edward G.; and Hornbeck, Frederick C., 4,258,101, Cl. 428-371.000.
Horne, David H. Minimizing evaporative losses from fuel tanks. 4,258,082, Cl. 427-160.000.
Horner, Sven H. N.: *See*—
Tisell, Claes-Gustav E. Y.; Lundell, Karl E. B.; Horner, Sven H. N.; Thorstensson, Gustav Y.; and Karlstedt, Gustav S. E., 4,257,315, Cl. 92-26.000.
Hoshimi, Susumu: *See*—
Takeda, Masashi; Hoshimi, Susumu; and Sato, Toshio, 4,258,299, Cl. 318-258.000.
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Laing, Jean W.; and Hubble, Fred F., III, 4,258,258, Cl. 250-324.000.
Hudson, Robert H.: *See*—
Ptaszek, George W.; and Hudson, Robert H., 4,257,610, Cl. 273-248.000.
Huestis, Davis L.: *See*—
McCusker, Michael V.; Lorents, Donald C.; Hill, Robert M.; and Huestis, Davis L., 4,258,334, Cl. 331-94.50G.
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Straznicky, Joseph; and Kumjian, Alexander A., 4,258,273, Cl. 307-221.00R.
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Edwards, Colin W., 4,258,355, Cl. 340-347.0DA.
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Schmidt, Paul J.; and Hung, William M., 4,257,954, Cl. 260-326.12R.
Hunt, Kevin W.; and Taylor, Peter J., to Vickers Limited. Underwater pipelines. 4,257,719, Cl. 405-173.000.
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Ashton, David H.; and Tharrington, George, Jr., 4,258,130, Cl. 435-7.000.
Hunter, Edwin J., to Toro Company, The. Injection pump for sprinkler systems. 4,257,440, Cl. 137-99.000.
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Hunter, John J. Method of making pipe coupling joint. 4,257,155, Cl. 29-511.000.
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Clinton, James R., 4,258,337, Cl. 331-110.000.
Hurle, Donald T. J.; and Joyce, Gordon C., to National Research Development Corporation. Automatic control of crystal growth. 4,258,003, Cl. 422-109.000.
Hurner, Erwin E. Fuel-water separator. 4,257,890, Cl. 210-112.000.
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Domer, Michel; and Kriese, Eberhard, 4,257,242, Cl. 64-14.000.
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Tetenborg, Konrad; and Huwelmann, Helmut, 4,257,209, Cl. 53-371.000.
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Elliston, Thomas L., 4,257,456, Cl. 137-613.000.
Iantorno, James, to Sealectro Corporation. Non-insulated printed circuit jack with retaining feature. 4,257,667, Cl. 339-221.00R.
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Massino, Chester F., 4,257,598, Cl. 273-60.00R.
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Sogo, Yukio; Ido, Kazuo; Taneda, Kozo; Sakai, Katzuji; and Sato, Yoichiro, 4,257,786, Cl. 55-261.000.
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IHC Holland N.V.: *See*—
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Ikenoue, Shinpei; Suzuki, Yoshiaki; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Thermally developable light sensitive material using trivalent and tetravalent cerium compounds. 4,258,129, Cl. 430-620.000.
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Imhoff, Kathy S. Disposable pet dish. 4,257,353, Cl. 119-61.000.
IMI Marston Limited: *See*—
Brodie, George W., 4,257,528, Cl. 220-89.00A.
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Barton, John E. D.; Headford, Donald W. R.; and Collins, David J., 4,257,801, Cl. 71-70.000.
Downing, Stephen B., 4,257,140, Cl. 15-230.110.
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Quan, Peter M.; Hunter, James S.; Lawson, John R.; and Moore, John H., 4,257,944, Cl. 260-207.100.
Whittaker, Graham; and O'Brien, Anne, 4,257,857, Cl. 204-158.0HA.
Yelland, Michael, 4,257,977, Cl. 260-510.000.

Ina, Toshikazu: *See—*
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Industrial Automation Corp.: *See—*
Peyton, John J., 4,257,727, Cl. 414-416.000.

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Schmidt, Herbert; Kurz, Erwin; Berger, Rudolf; and Pilz, Erich, 4,257,728, Cl. 414-468.000.

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Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,257,191, Cl. 47-48.500.

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Green, Kieron P.; Inglis, Bruce R.; Allen, Roger A.; and Tringham, Roger W., 4,257,754, Cl. 425-84.000.

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Mills, Norman T., 4,257,473, Cl. 164-82.000.

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Moraru, Dino S., 4,258,090, Cl. 427-386.000.

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Scorteanu, Ionel R.; Spirea, Emil; and Cristea, Radu, 4,257,669, Cl. 350-6.800.

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Anderson, Leslie C., 4,257,904, Cl. 260-33.20R.
Balanson, Richard D.; Economy, James; Huang, Samuel J.; and Smith, Thor L., 4,258,146, Cl. 525-106.000.
Balliet, Layton, 4,257,672, Cl. 350-96.170.
Berglund, Neil C.; and Luick, David A., 4,258,417, Cl. 364-200.000.
Economy, James; Flandera, Mary Ann; and Liu, Cheng-Yih, 4,258,079, Cl. 427-44.000.
Hassan, Javathu K.; and Paivanas, John A., 4,257,637, Cl. 294-64.00B.
Heath, Chester A., 4,258,418, Cl. 364-200.000.
Hydes, Alan F.; and Jones, Alan L., 4,258,361, Cl. 340-721.000.
Schwuttke, Guenter H.; and Yang, Kuei-Hsiung, 4,257,827, Cl. 148-1.500.

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Lee, Thomas K. P.; and Lam, Hau C., 4,258,358, Cl. 340-543.000.

International Standard Electric Corporation: *See—*
Ege, Sigmund, 4,257,717, Cl. 405-154.000.

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Hockham, George A.; and Wolfson, Ronald I., 4,258,365, Cl. 343-763.000.

Intraub, Julius: *See—*
Ornstein, Leonard; Williams, Hazel E.; and Intraub, Julius, 4,257,346, Cl. 118-641.000.

Inverni Della Beffa S.p.A.: *See—*
Lietti, Andrea; and Bonati, Attilio, 4,258,055, Cl. 424-283.000.

Ionescu, Alexandru D., to New England Machinery, Inc. High speed bottle orienting apparatus. 4,257,516, Cl. 198-399.000.

Ishibashi, Hiroshi; and Iwano, Haruhika, to Fuji Photo Film Co., Ltd. Reversal color development process. 4,258,127, Cl. 430-379.000.

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Shibuya, Chisei; Ishii, Kunihiko; Sano, Takumi; and Ishida, Torao, 4,258,195, Cl. 548-136.000.

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Ishida, Yoichi: *See—*
Sato, Toshihiko; Ishida, Yoichi; and Iwashita, Kanau, 4,257,227, Cl. 60-290.000.

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Ishikawa, Shozi: *See—*
Matsuyama, Kiyoshi; Ishikawa, Shozi; Hirata, Seizi; and Ogura, Tsutomu, 4,257,533, Cl. 222-1.000.

Ishikawa, Tetsuo: *See—*
Sekiguchi, Sadao; Matsumoto, Kojiro; Ishikawa, Tetsuo; Mishiba, Saburo; and Izaki, Nobujiro, 4,257,935, Cl. 260-29.70H.

Ishiwaka, Takumi: *See—*
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Isono, Masamichi: *See—*
Abe, Kenji; Tsuge, Ayao; Hirao, Yasuhiko; Hori, Keiichi; and Isono, Masamichi, 4,257,819, Cl. 134-19.000.

Italrame S.p.A.: *See—*
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Itek Corporation: *See—*
Albertinetti, Nedo P.; and Aldrich, Ralph E., 4,257,686, Cl. 350-360.000.

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Hartmann, Werner; Kutz, Johannes; and Itgenshorst, Dieter, 4,257,246, Cl. 68-200.000.

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Itoh, Katsumi: *See—*
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,258,307, Cl. 322-28.000.

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Iwaki, Katsutaro: *See—*
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Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Transmission throttle valve of automatic power transmission. 4,257,441, Cl. 137-116.300.

Iwano, Haruhika: *See—*
Ishibashi, Hiroshi; and Iwano, Haruhika, 4,258,127, Cl. 430-379.000.

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Sato, Toshihiko; Ishida, Yoichi; and Iwashita, Kanau, 4,257,227, Cl. 60-290.000.

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J. Hengstler K. G.: *See—*
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J.M. Voith GmbH: *See—*
Henrich, Hans, 4,257,563, Cl. 241-17.000.

Jackson, Kenneth A.; Kimerling, Lionel C.; and Leamy, Harry J., to Bell Telephone Laboratories, Incorporated. Photo-induced temperature gradient zone melting. 4,257,824, Cl. 148-1.500.

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Jakob, Fritz, to Linde Aktiengesellschaft. Recovery of the heat content of corrosive and dust-containing gases. 4,257,475, Cl. 165-1.000.

Jaksity, Laszlone: *See—*
Mariasi, Bela; Molnar, Laszlo; Toth, Janos; Gulya, Imre; Nagy, Miklos; Wolfram, Ervin; Zrinyi, Miklos; Kovacs, Gaborne; and Jaksity, Laszlone, 4,258,163, Cl. 526-202.000.

Jakubowicz, Raymond F.: *See—*
Schnipelsky, Paul N.; and Jakubowicz, Raymond F., 4,257,862, Cl. 204-195.00R.

Jalbert, Vincent P., to SCM Corporation. Multi bar encoding apparatus utilizing acoustic energy. 4,258,356, Cl. 340-365.00R.

James, David R.: *See—*
Christophorou, Loucas G.; James, David R.; Pace, Marshall O.; and Pai, Robert Y., 4,257,905, Cl. 252-571.000.

Jarre, Wolfgang; Mueller, Gerhard; Zipp, Otmar; and Ropte, Eckhard, to BASF Aktiengesellschaft. Process for manufacture of flexible polyurethane foams with cyanic acid derivatives. 4,258,141, Cl. 521-114.000.

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Asp, Peter; Jarsen, Dieter; Eggert, Heinrich; and Klingelholler, Wilhelm, 4,257,838, Cl. 156-439.000.

Jay Boyce & Associates: *See—*
Boyce, Jay, 4,258,303, Cl. 318-811.000.

Jean, Leonard P.; and La Chance, Ernest J., Sr., to Hendrix Wire & Cable Corp. Electrical insulator having clamping jaws with separately fabricated liner members. 4,258,228, Cl. 174-168.000.

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Jensen, Erik H.: *See—*
De Leon, Noel; Larsen, Arno I. M.; Knudsen, Poul E.; and Jensen, Erik H., 4,258,009, Cl. 422-250.000.

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Fromont, Jacques L., 4,258,300, Cl. 318-318.000.

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Bernard, Vincent E., 4,258,066, Cl. 426-231.000.

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Solomon, Donald F., 4,257,507, Cl. 192-43.100.

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Bourke, Robert F.; and Johansen, David K., 4,258,306, Cl. 320-48.000.

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Vaughn, George L.; and Hollingsworth, John D., 4,257,148, Cl. 19-98.000.

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John-Nelson Corporation: *See*—
Hickling, Nelson F., 4,257,379, Cl. 123-518.000.

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Reed, Robert D., 4,257,763, Cl. 431-188.000.
Zink, John S.; Reed, Robert D.; Glomm, Horst M.; and Sawatski, Klaus E., 4,257,762, Cl. 431-177.000.

Johne, Albrecht, to VEB Polygraph Leipzig, Kombinat fur polygraphische Maschinen und Ausrustungen. Capacitive detection of absent and/or double sheets in the sheet transport path of a printing machine. 4,258,326, Cl. 328-5.000.

Johns-Hunt, John, to Chubb & Son's Lock and Safe Co., Ltd. Combination lock. 4,257,249, Cl. 70-303.00A.

Johnson, Carl E.: *See*—
Gibby, Ronald L.; Lawrence, Leo A.; Woodley, Robert E.; Wilson, Charles N.; Weber, Edward T.; and Johnson, Carl E., 4,257,847, Cl. 176-68.000.

Johnson, Matthey & Co., Limited: *See*—
Enga, Bernard E., 4,257,223, Cl. 60-39.040.

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Jonas, Rochus; Becker, Karl-Heinz; Enenkel, Hans-Joachim; Minck, Klaus; and Schliep, Hans-Jochen, to Merck Patent Gesellschaft mit beschrankter Haftung. Phenoxy-amino-propanols. 4,258,062, Cl. 424-330.000.

Jones, Alan L.: *See*—
Hydes, Alan F.; and Jones, Alan L., 4,258,361, Cl. 340-721.000.

Jones, Arthur. Exercising apparatus with improvements in handle structure, rope arrangement, and clamping means. 4,257,592, Cl. 272-126.000.

Jones, Donald W. Centrifugal air classifying apparatus. 4,257,880, Cl. 209-144.000.

Jones, Ted: *See*—
Banks, Allen R.; Fibiger, Richard F.; and Jones, Ted, 4,258,204, Cl. 560-205.000.

Jorzyk, Sigurd; and Wurfel, Helmut, to Saarbergwerke Aktiengesellschaft. Process for the purification of undistillable solid-containing hydrocarbon fractions produced in coal-refining. 4,257,870, Cl. 208-39.000.

Joseph, Joseph P.; and Bernstein, Seymour, to American Cyanamid Company. Lactobionic acid poly(H-sulfate) and salts thereof useful as complement inhibitors. 4,258,034, Cl. 424-180.000.

Joshi, Ashok V.: *See*—
Liang, Charles C.; and Joshi, Ashok V., 4,258,109, Cl. 429-191.000.

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Hurle, Donald T. J.; and Joyce, Gordon C., 4,258,003, Cl. 422-109.000.

Judge, Harold R.; and Harger, Linda J., to Cosmos Energy Innovation S.A. High intensity discharge lighting system. 4,258,293, Cl. 315-203.000.

Juhasz, John E.; and Williams, Hansel O., to Rockwell International Corporation. Vehicle monitoring and recording system. 4,258,421, Cl. 364-424.000.

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Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,257,941, Cl. 260-152.000.

Jung, Klaus: *See*—
Wober, Wolfram; Franzius, Dirk; Andersson, Gerd; Jung, Klaus; Suess, Peter; and Wagner, Claus, 4,257,889, Cl. 210-104.000.

Jung Products, Inc.: *See*—
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Junga Verkstader AB: *See*—
Gestblom, Barbro; Martinsson, Christer; and Treijner, Hakan, 4,257,170, Cl. 34-48.000.

Junginger, Hans G.: *See*—
Clasen, Rolf; and Junginger, Hans G., 4,258,114, Cl. 430-67.000.

Jury, Harold R., to Flight Furniture Pty. Ltd. Metal forming process. 4,257,251, Cl. 72-57.000.

Jutte, Ralph B., Jr.: *See*—
Cottrell, Walter D., Jr.; and Jutte, Ralph B., Jr., 4,258,106, Cl. 428-482.000.

Juvin, Pierre, to Sertog Societe d'Etudes de Recherches de Travoux d'Organisation et de Gestion. Therapeutic compounds for the treatment of uro-genital disorders. 4,258,037, Cl. 424-195.000.

Kabel-und Metallwerke Gutehoffnungshutte AG.: *See*—
Schauer, Friedrich; and Wolff, Manfred, 4,257,666, Cl. 339-218.00M.

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Fujitani, Takeo; and Matsuoka, Kajio, 4,258,100, Cl. 428-315.000.

Kabushiki Kaisha Ono Sokki Seisakusho: *See*—
Ono, Masamichi; Eto, Akira; and Yagi, Hideji, 4,257,261, Cl. 73-134.000.

Kabushiki Kaisha Saginomiya Seisakusho: *See*—
Nishimi, Ichiro, 4,258,344, Cl. 335-129.000.

Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,257,326, Cl. 101-288.000.
Sato, Yo, 4,257,327, Cl. 101-288.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Asakawa, Tatsushi; and Morozumi, Shinji, 4,258,310, Cl. 323-281.000.

Kadija, Igor V., to Olin Corporation. Method for producing liquid permeable diaphragms for an electrolytic cell. 4,258,081, Cl. 427-121.000.

Kaelber, Gunter, to BBC Brown Boveri & Company Limited. Fastening arrangement especially for a turbine and a condenser. 4,257,233, Cl. 60-687.000.

Kageyama, Takao, to Nippon Electric Co., Ltd. Coupled cavity type traveling wave tube. 4,258,286, Cl. 315-3.600.

Kahler, Royce C., Jr.: *See*—
Friend, David; and Kahler, Royce C., Jr., 4,257,305, Cl. 84-1.240.

Kai Cutlery Center Co., Ltd.: *See*—
Murai, Yosiichi, 4,257,160, Cl. 30-41.000.

Kai, Fumio; Tsuruoka, Takashi; Makabe, Osamu; Inouye, Shigeharu; Ikeda, Hitoshi; Kazuno, Yuzo; Nakajima, Shokichi; Seki, Shigeo; and Niida, Taro, to Meiji Seika Kaisha Ltd. Cephalosporin derivatives. 4,258,184, Cl. 544-27.000.

Kaiser, Donald B.: *See*—
Month, Alfred; and Kaiser, Donald B., 4,258,284, Cl. 313-390.000.

Kaiser, Roman, to Givaudan Corporation. 1,4-Epoxy-1,3,3-trimethyl-2-(2-buten-1-ylidene)cyclohexanes as flavorants. 4,258,071, Cl. 426-536.000.

Kajimoto, Tsunesuke, to Toray Industries, Inc. Catalyst composition and method for oxidation of ethylene to ethylene oxide and method of catalyst manufacture. 4,257,967, Cl. 260-348.340.

Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; Kitada, Hisashi; and Uehara, Yumito, to Mitsubishi Chemical Industries Ltd. Process for polymerizing propylene. 4,258,161, Cl. 526-153.000.

Kamei, Kenzo: *See*—
Tanimura, Shozo; Saito, Yasuhisa; Horiuchi, Hiroshi; Mieno, Kazunori; Nakao, Shinji; Nakano, Takaaki; and Kamei, Kenzo, 4,257,926, Cl. 260-3.000.

Kamei, Tatsuya: *See*—
Miyata, Kenji; Kamei, Tatsuya; and Okamura, Masahiro, 4,258,377, Cl. 357-38.000.

Kammerer, Friedrich-Johannes; Gebert, Ulrich; and Alpermann, Hans G., to Hoechst Aktiengesellschaft. Pyrano-heterocycles and medicaments containing these compounds. 4,258,046, Cl. 424-258.000.

Kammerer, GilbertE.: *See*—
Bixby, James A.; Wright, Charles E.; and Kammerer, GilbertE., 4,258,398, Cl. 360-76.000.

Kamphuts, Gerrit G.: *See*—
Eversdijk, Bastiaan P.; and Kamphuts, Gerrit G., 4,257,785, Cl. 55-89.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Dairaku, Kazuo; and Kuki, Kazuo, 4,257,257, Cl. 73-19.000.

Kaneko, Kenji; Okabe, Takahiro; Nakamura, Tohru; Takasugi, Wasao; and Nagata, Minoru, to Hitachi, Ltd. Differential current amplifier. 4,258,330, Cl. 330-257.000.

Kaneko, Kenji: *See*—
Watanabe, Tomoyuki; Okabe, Takahiro; Nagata, Minoru; Nakamura, Tohru; Kaneko, Kenji; Okada, Yutaka; Anzai, Norio; Nishimura, Takanori; and Agatsuma, Takashi, 4,258,379, Cl. 357-44.000.

Kantor, Martin L.: *See*—
Auerbach, Joseph; and Kantor, Martin L., 4,258,059, Cl. 424-321.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Watanabe, Noritoshi; Nakamura, Masato; and Fujita, Seigoro, 4,257,843, Cl. 162-146.000.

Kao, Jar-lin; and Sheng, Ming N., to Atlantic Richfield Company. Preparation of esters from organic bromo alkyl tellurium compounds. 4,258,208, Cl. 560-266.000.

Karayannis, Nicholas M.; and Lee, Sam S., to Standard Oil Company (Indiana). Polymerization process. 4,258,168, Cl. 526-139.000.

Karlstedt, Gustav S. E.: *See*—
Tisell, Claes-Gustav E. Y.; Lundell, Karl E. B.; Horner, Sven H. N.; Thorstensson, Gustav Y.; and Karlstedt, Gustav S. E., 4,257,315, Cl. 92-26.000.

Karp, Joseph G., to Union Carbide Corporation. Stuffed food casing break detector - shutoff. 4,257,146, Cl. 17-49.000.

Karube, Norio; Morita, Yasuyuki; Yamaka, Eizo; and Kuno, Takasi, to Matsushita Electric Industrial Co., Ltd. Rotor balancing device utilizing a laser beam. 4,258,246, Cl. 219-121.0LW.

Kascha, Waldemar: *See*—
Bahrmann, Helmut; Cornils, Boy; Diekhaus, Gerhard; Kascha, Waldemar; and Weber, Jurgen, 4,258,214, Cl. 568-454.000.

Kasiewicz, Stanley J. Control circuit for engine speed governor. 4,257,361, Cl. 123-352.000.

Kassfeldt, Hillar, to Tridon Limited. Flasher devices for lamps. 4,258,292, Cl. 315-200.00A.

Kasting, Edward W., to Cummins Engine Company, Inc. Combined gear cover and mount for an internal combustion engine. 4,257,370, Cl. 123-198.00E.

Kasuga, Muneo: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,257,700, Cl. 355-3.0TR.

Kato, Hisatoyo: *See*—
Kotera, Noboru; Eguchi, Syusaku; Miyahara, Junji; Matsumoto, Seiji; and Kato, Hisatoyo, 4,258,264, Cl. 250-484.000.

Kato, Nobukatsu; Takase, Tsutomu; and Morimoto, Yoshio, to Mitsui Toatsu Chemicals, Inc. Process for producing hydroquinone. 4,258,219, Cl. 568-771.000.

Kato, Sadao: *See*—
Kyo, Kayomon; Asahara, Nakaba; Asai, Yasuhiko; Hirose, Isamu; and Kato, Sadao, 4,258,154, Cl. 525-425.000.

Kauffman, William J.; and Lilley, George L., to Armstrong Cork Company. Process of forming an embossed surface covering. 4,258,085, Cl. 427-244.000.

Kaufmann, Meinolph; and Kmetz, Allan R., to BBC Brown Boveri & Company Limited. Display device having adjoining display elements, and a method of producing the display device. 4,258,364, Cl. 340-765.000.

Kaukeinen, Joseph Y.; and Wright, Hal E., to Eastman Kodak Company. Sensitizer for electrophoretic migration imaging dispersions. 4,258,112, Cl. 430-34.000.

Kaupin, William B.; and Szczesuil, Stephen P., to William Carter Company, The. Infant garment. 4,257,127, Cl. 2-75.000.

Kawa, Ryuichi, to Ricoh Company, Ltd. Servo motor apparatus. 4,258,301, Cl. 318-594.000.

Kawaguchi, Fumikazu: *See*—
Fujita, Isao; Onoda, Mamoru; Kawaguchi, Fumikazu; Takenaka, Yoshimichi; and Tsutaya, Tadao, 4,257,806, Cl. 75-3.000.

Kawai, Hisasi: *See*—
Matsui, Takeshi; Kohama, Tokio; Kawai, Hisasi; Nishimatsu, Akira; Ina, Toshikazu; Nohira, Hidetaka; and Kobashi, Kiyoshi, 4,257,382, Cl. 123-571.000.

Kawai, Junji: *See*—
Ohzeki, Toshio; Akutsu, Mitsuo; and Kawai, Junji, 4,258,142, Cl. 525-2.000.

Kawai, Kenji: *See*—
Murakami, Tadashi; Yamane, Mamoru; Tokairin, Toshio; and Kawai, Kenji, 4,257,778, Cl. 44-1.00R.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,257,304, Cl. 84-1.230.

Kawakami, Kanji: *See*—
Shimada, Satoshi; Kawakami, Kanji; and Nishihara, Motohisa, 4,257,274, Cl. 73-718.000.

Kawakita, Hiroaki, to Dukane Corporation. Stand device for boom-type working implements. 4,257,730, Cl. 414-686.000.

Kawamura, Reeko: *See*—
Matsumoto, Yasuji; Murai, Bunjiro; and Kawamura, Reeko, 4,257,936, Cl. 260-37.0SB.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujikawa, Tetsuzo; and Kimura, Tomoya, 4,257,367, Cl. 123-185.0BB.

Kawasaki Kasei Chemicals Ltd.: *See*—
Matsuura, Ryo; Sakai, Kazuaki; Sato, Tuneyasu; Yamada, Yorinobu; and Bandow, Kowzo, 4,257,851, Cl. 203-31.000.

Kawase, Hideyuki: *See*—
Iijima, Kazunori; Honma, Kazuo; Terayama, Takao; Yoshida, Masashi; Kawase, Hideyuki; and Miyakawa, Seii, 4,258,399, Cl. 360-85.000.

Kawase, Kazuo: *See*—
Fujita, Tomohiro; Iida, Kennosuke; and Kawase, Kazuo, 4,257,496, Cl. 188-72.600.

Kawase, Mitsuo; and Watanabe, Hiroyuki, to Toyoda Jidosha Kogyo Kabushiki Kaisha. Supporting structure for a suspension member for a vehicle. 4,257,623, Cl. 280-660.000.

Kawata, Hiroitsu; Ohmura, Tadayoshi; Shiozawa, Hiroyoshi; and Hattori, Munetaka, to Yamanouchi Pharmaceutical Co., Ltd. Coating agents for solid medicaments. 4,258,179, Cl. 536-95.000.

Kawate, Kenji: *See*—
Yoshimoto, Hiromu; Okumura, Michitoshi; and Kawate, Kenji, 4,257,829, Cl. 148-13.000.

Kazaoka, Manabu: *See*—
Morishita, Teru; and Kazaoka, Manabu, 4,257,235, Cl. 60-736.000.

Kazuno, Yuzo: *See*—
Kai, Fumio; Tsuruoka, Takashi; Makabe, Osamu; Inouye, Shigeharu; Ikeda, Hitoshi; Kazuno, Yuzo; Nakajima, Shokichi; Seki, Shigeo; and Niida, Taro, 4,258,184, Cl. 544-27.000.

Keedy, Edgar L. Vehicle drag reducer. 4,257,641, Cl. 296-1.00S.

Keeler Corporation: *See*—
Keeler, Miner S., II, 4,257,581, Cl. 267-116.000.

Keeler, Miner S., II, to Keeler Corporation. Impact absorbing strut. 4,257,581, Cl. 267-116.000.

Keepers, Hugh E., to Varel Manufacturing Company. Filament wound bearing. 4,257,654, Cl. 308-8.200.

Kefeli, Tamara Y.: *See*—
Berlin, Alfred A.; Kefeli, Tamara Y.; Varlamova, Nina V.; Strongin, Grigory M.; Altshuler, Judif M.; Kolomazov, Boris I.; and Efimov, Alexei V., 4,258,164, Cl. 526-301.000.

Keiser Corporation: *See*—
Keiser, Dennis L., 4,257,593, Cl. 272-130.000.

Keiser, Dennis L., to Keiser Corporation. Pneumatic exercising device. 4,257,593, Cl. 272-130.000.

Kelderman, Hendrik C.: *See*—
Van Berkel, Johannes; and Kelderman, Hendrik C., 4,258,205, Cl. 560-231.000.

Kellet, William H.; and Mills, Peter S., to Coal Industry (Patents) Limited. Accelerating agents for accelerating hardening of cement. 4,257.814, Cl. 106-90.000.

Kelly, Franklin G.; Bashin, Saul; and Kennedy, Robert E., to TRW Inc. Universal solar cell/conductor junction element and solar panel embodying same. 4,257,821, Cl. 136-244.000.

Kempf, Georg: *See*—
Hiller, Heinz; Schlauer, Johann; Doerges, Alexander; Kempf, Georg; Svoboda, Vaclav; and Zeschmar, Winfried, 4,258,019, Cl. 423-223.000.

Kennedy, Paul G., to Westinghouse Electric Corp. Digital circuit for accurately detecting changes in the gray scale of a scanned image. 4,258,394, Cl. 358-284.000.

Kennedy, Robert E.: *See*—
Kelly, Franklin G.; Bashin, Saul; and Kennedy, Robert E., 4,257,821, Cl. 136-244.000.

Kerby, Frederick A. Collapsible pool cover assembly. 4,257,132, Cl. 4-498.000.

Kessler, Sebastian W., Jr., to RCA Corporation. Minimum pressure drop liquid cooled structure for a semiconductor device. 4,258,383, Cl. 357-82.000.

Kessler, Stephen B., to Becton, Dickinson and Company. Apparatus for the separation of blood components. 4,257,886, Cl. 210-516.000.

Ketchman, Jeffrey, to AMF Incorporated. Exercise bicycles. 4,257,588, Cl. 272-73.000.

Kiefer, Kevin W.: *See*—
Christiansen, David A.; Kiefer, Kevin W.; Naley, Lowell B.; Seipp, Ronald W.; Shirek, Lawrence J.; and Harrington, Robert L., 4,257,240, Cl. 62-448.000.

Kikuchi, Hiroyuki: *See*—
Yoshida, Keizo; Fujii, Takashi; and Kikuchi, Hiroyuki, 4,258,134, Cl. 435-201.000.

Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,258,192, Cl. 546-166.000.

Kim, Dae K.; Bertolacini, Ralph J.; Gutberlet, L. Charles; and Robinson, Ken K., to Electric Power Research Institute, Inc. Process for coal liquefaction and catalyst. 4,257,922, Cl. 252-465.000.

Kimerling, Lionel C.: *See*—
Jackson, Kenneth A.; Kimerling, Lionel C.; and Leamy, Harry J., 4,257,824, Cl. 148-1.500.

Kimishima, Makoto; and Shinoda, Naoharu, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for removing mist or the like from a gas flow. 4,257,793, Cl. 55-394.000.

Kimmel, J. D.: *See*—
Toelke, Lester; and Kimmel, J. D., 4,257,245, Cl. 64-23.000.

Kimura, Tomoya: *See*—
Fujikawa, Tetsuzo; and Kimura, Tomoya, 4,257,367, Cl. 123-185.0BB.

Kimura, Yoshiaki; and Nakazawa, Terutada, to Kinki Sharyo Kabushiki Kaisha. Delivery apparatus for automatic newspaper vending machine. 4,257,531, Cl. 221-227.000.

Kindig, James K.; and Turner, Ronald L., to Hazen Research, Inc. Process for beneficiating oxide ores. 4,257,881, Cl. 75-1.00R.

King-Seeley Thermos Co.: *See*—
Hoenisch, Walter H., 4,257,237, Cl. 62-157.000.

Kingsbury, William D.: *See*—
Gyurik, Robert J.; and Kingsbury, William D., 4,258,198, Cl. 548-306.000.

Kinki Sharyo Kabushiki Kaisha: *See*—
Kimura, Yoshiaki; and Nakazawa, Terutada, 4,257,531, Cl. 221-227.000.

Kinugawa, Masumi; and Yamazoe, Hisamitsu, to Nippondenso Co., Ltd. Engine control system. 4,257,377, Cl. 123-492.000.

Kirjavainen, Kari J., to Oy Nokia AB. Method of and a regulator for adjusting the capacity and the diameter of an electric conductor. 4,257,991, Cl. 264-40.600.

Kirk, Jennie M.: *See*—
Hancock, Ronald D.; and Kirk, Jennie M., 4,257,916, Cl. 252-430.000.

Kirtland, Howard W.: *See*—
Bandukwalla, Phiroze; Mount, Gordon L.; and Kirtland, Howard W., 4,257,733, Cl. 415-13.000.

Kis France: *See*—
Crasnianski, Serge, 4,257,323, Cl. 101-41.000.

Kishimoto, Yoshio: *See*—
Sekine, Yoichi; Kishimoto, Yoshio; and Shimotsuma, Wataru, 4,258,371, Cl. 346-140.00R.
Sonoda, Nobuo; Shimotsuma, Wataru; Kishimoto, Yoshio; and Sekine, Yoichi, 4,258,080, Cl. 427-82.000.

Kita, Toru; Kobayashi, Hiroshi; and Fujishiro, Takeshi, to Nissan Motor Company, Limited. Probe unit of fluid flow rate measuring apparatus. 4,257,276, Cl. 73-861.220.

Kitada, Hisashi: *See*—
Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; Kitada, Hisashi; and Uehara, Yumito, 4,258,161, Cl. 526-153.000.

Kitamura, Masatsugu; Onoye, Hideo; and Yamazaki, Masami, to Victor Company of Japan, Limited. Automatic recording level controlling circuit. 4,258,397, Cl. 360-31.000.

Kitsch, Edward A.: *See*—
Arnold, Harold D.; and Kitsch, Edward A., 4,258,368, Cl. 318-762.000.

Klebe, Hans: *See*—
Schmid, Josef; Lange, Ludwig; Klebe, Hans; and Schutte, Dieter, 4,258,023, Cl. 423-336.000.

Kleber, Rolf; Panke, Hans L.; and Hoffmann, Erich, to Hoechst Aktiengesellschaft. Use of quaternary ether amines as fiber processing agents. 4,257,769, Cl. 8-188.000.

Kleefeldt, Frank; and Krause, Lothar, to Arn. Kiekert Soane. Vehicle door lock control. 4,257,634, Cl. 292-336.300.

Klibanov, Alexandr M.: *See*—
Berezin, Ilia V.; Goldmakher, Viktor S.; Klibanov, Alexandr M.; Martinek, Karel; Mishin, Alexandr A.; Samokhin, Gennady P.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; and Chazov, Evgeny I., 4,257,269, Cl. 73-606.000.
Klimaszewski, Leo T., to ACF Industries, Incorporated. By-pass valve. 4,257,226, Cl. 60-290.000.
Klimaszewski, Leo T., to ACF Industries, Incorporated. By-pass valve. 4,257,228, Cl. 60-290.000.
Klingelholler, Wilhelm: *See*—
Asp, Peter; Jarsen, Dieter; Eggert, Heinrich; and Klingelholler, Wilhelm, 4,257,838, Cl. 156-439.000.
Klobe, Martin, to Siemens Aktiengesellschaft. Flow measuring device. 4,257,277, Cl. 73-861.240.
Klockow, Michael: *See*—
Gante, Joachim; Radunz, Hans-Eckart; Orth, Dieter; Minck, Klaus; Wild, Albrecht; and Klockow, Michael, 4,258,047, Cl. 424-250.000.
Klose, Werner: *See*—
Elsner, Georg; Klose, Werner; May, Christian; and Heymer, Gero, 4,258,022, Cl. 423-299.000.
Kmetz, Allan R.: *See*—
Kaufmann, Meinolph; and Kmetz, Allan R., 4,258,364, Cl. 340-765.000.
Knell, Martin: *See*—
Zussman, Hyman W.; Knell, Martin; and Dexter, Martin, 4,258,149, Cl. 525-193.000.
Knowd, Michael J., to Minnesota Mining and Manufacturing Company. Sound pressure level meter. 4,257,273, Cl. 73-647.000.
Knudsen, Poul E.: *See*—
De Leon, Noel; Larsen, Arno I. M.; Knudsen, Poul E.; and Jensen, Erik H., 4,258,009, Cl. 422-250.000.
Knudsen, Ronald D.; and Bjornson, Geir, to Phillips Petroleum Company. Cleavage of alkylenebisphenols. 4,258,221, Cl. 568-806.000.
Knyazev, Vadim A.: *See*—
Kudryavtsev, Boris B.; Krasnokutsky, Valentin P.; Fedotov, Lev A.; Sholk, Semen F.; Svidler, Jury R.; Zhigarev, Ivan V.; Begunov, Nikolai N.; Kostylev, Valentin F.; Brodsky, Jury M.; and Knyazev, Vadim A., 4,257,888, Cl. 210-97.000.
Kobashi, Kiyoshi: *See*—
Matsui, Takeshi; Kohama, Tokio; Kawai, Hisasi; Nishimatsu, Akira; Ina, Toshikazu; Nohira, Hidetaka; and Kobashi, Kiyoshi, 4,257,382, Cl. 123-571.000.
Kobayashi, Hiroshi: *See*—
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Kobe Steel, Limited: *See*—
Fujita, Isao; Onoda, Mamoru; Kawaguchi, Fumikazu; Takenaka, Yoshimichi; and Tsutaya, Tadao, 4,257,806, Cl. 75-3.000.
Kobori, Toshio: *See*—
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Kockums Industri AB: *See*—
Wangeby, Percy; and Pahlsson, Nils-Erik, 4,257,461, Cl. 144-2.00Z.
Kodama, Takashi: *See*—
Yoshida, Masahide; and Kodama, Takashi, 4,258,401, Cl. 360-125.000.
Koeln, Harold E.: *See*—
Sherman, Alan E.; and Koeln, Harold E., 4,257,713, Cl. 401-88.000.
Koenig, Karl-Heinz; Oeser, Heinz-Guenter; and Feuerherd, Karl-Heinz, to BASF Aktiengesellscahft. Process for the preparation of α,β-dihaloalkyl isocyanates. 4,257,974, Cl. 260-453.00A.
Kofahl, William M. Pneumatically powered pump. 4,257,751, Cl. 417-394.000.
Koganei, Masaharu: *See*—
Wada, Hideo; Ushio, Akiro; and Koganei, Masaharu, 4,257,828, Cl. 148-6.160.
Kohama, Tokio: *See*—
Matsui, Takeshi; Kohama, Tokio; Kawai, Hisasi; Nishimatsu, Akira; Ina, Toshikazu; Nohira, Hidetaka; and Kobashi, Kiyoshi, 4,257,382, Cl. 123-571.000.
Kohayakawa, Yoshimi, to Canon Kabushiki Kaisha. Eye examining instrument with photo-detecting system. 4,257,687, Cl. 351-7.000.
Kohling, Rolf: *See*—
Bogenschneider, Bernd; Kohling, Rolf; Kubitza, Heinz; Blankmeister, Wilhelm; and Leininger, Dieter, 4,257,879, Cl. 209-5.000.
Kohnke, Ole B., to Hesse, Ruth L. Peep valve with improved vibration damping. 4,257,453, Cl. 137-514.300.
Kojima, Teruo, to Fuji Photo Film Co., Ltd. Photopolymerizable compositions. 4,258,121, Cl. 430-281.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Nakagome, Yukio; Niiro, Yasuhiko; Wakabayashi, Hiroharu; and Nunokawa, Makoto, 4,257,675, Cl. 350-96.230.
Yamazaki, Yasuhiro; Wakahara, Yasushi; Yuuki, Kiyohiro; and Yamada, Toyomichi, 4,258,392, Cl. 358-260.000.
Kolomazov, Boris I.: *See*—
Berlin, Alfred A.; Kefeli, Tamara Y.; Varlamova, Nina V.; Strongin, Grigory M.; Altshuler, Judif M.; Kolomazov, Boris I.; and Efimov, Alexei V., 4,258,164, Cl. 526-301.000.
Komine, Isamu: *See*—
Shimada, Katsuhiko; Komine, Isamu; Tanabe, Hideya; Tsunozaki, Shuichi; Yamada, Masayoshi; and Takahashi, Tsuguo, 4,258,319, Cl. 324-226.000.
Komline-Sanderson Engineering Corp.: *See*—
Albohn, Arthur R., 4,257,891, Cl. 210-221.200.
Kommanditbolaget Fredrik Mogensen & Co.: *See*—
Mogensen, Fredrik K., 4,257,882, Cl. 209-268.000.
Kompanek, Harry W. Sonic gravel packing method and tool for downhole oil wells. 4,257,482, Cl. 166-249.000.
Kon, Tetuaki: *See*—
Obara, Hiroshi; and Kon, Tetuaki, 4,258,259, Cl. 250-338.000.
Obara, Hiroshi; Kon, Tetuaki; and Murayama, Naohiro, 4,258,260, Cl. 250-338.000.
Kondo, Takashi; Tagawa, Yasuo; Mizuno, Kiyohiko; and Tsuboi, Nobutoshi, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Reed valve. 4,257,458, Cl. 137-855.000.
Konig, Ferdinand, to Sulzer Brothers Limited. Magnet coil. 4,258,347, Cl. 335-282.000.
Konig, Gerd: *See*—
Aller, Walther; Eisermann, Eckehard; Vahlhaus, Dieter; and Konig, Gerd, 4,257,542, Cl. 222-600.000.
Konishi, Seizo: *See*—
Nishimura, Nobuzi; Tsuji, Masayuki; Konishi, Seizo; Yamamoto, Tadashi; Tokieda, Takemi; Sawa, Utazi; and Koumura, Suketsugu, 4,257,770, Cl. 8-549.000.
Koo, Jackson C.: *See*—
Hendricks, Charles D.; Koo, Jackson C.; and Rosencwaig, Allan, 4,257,798, Cl. 65-21.400.
Rosencwaig, Allen; Koo, Jackson C.; and Dressler, John L., 4,257,799, Cl. 65-21.400.
Koppl, Ernest R.: *See*—
Ogle, Francis H., Jr.; and Koppl, Ernest R., 4,257,444, Cl. 137-315.000.
Korn, Hennig: *See*—
Ritzmann, Horst; Bauer, Klaus; Schmits, Heinz-Herbert; Goldmann, Wolf; and Korn, Hennig, 4,257,766, Cl. 432-14.000.
Korst, James J.: *See*—
Cronin, Timothy H.; Faubl, Hermann; Hoffman, William W.; and Korst, James J., 4,258,061, Cl. 424-325.000.
Koshkin, Nikolai N.: *See*—
Shirokov, Vasily I.; Maljutin, Gennady G.; Mishiev, Ilyasaf I.; Koshkin, Nikolai N.; Abdullaeva, Farida S.; Stukalenko, Anatoly K.; Novichkov, Alexandr N.; and Saveliev, Jury V., 4,257,794, Cl. 62-28.000.
Koster, Eike: *See*—
John, Heinrich; and Koster, Eike, 4,257,665, Cl. 339-186.00M.
Kostylev, Valentin F.: *See*—
Kudryavtsev, Boris B.; Krasnokutsky, Valentin P.; Fedotov, Lev A.; Sholk, Semen F.; Svidler, Jury R.; Zhigarev, Ivan V.; Begunov, Nikolai N.; Kostylev, Valentin F.; Brodsky, Jury M.; and Knyazev, Vadim A., 4,257,888, Cl. 210-97.000.
Koszegi, Bela: *See*—
Szabo, Tibor; Institoris, Laszlo; Kovacs, Gabor; Dalmadi, Gyula; Koszegi, Bela; and Stadler, Istvan, 4,257,962, Cl. 260-346.220.
Kotani, Kikuo: *See*—
Fujii, Tadashiro; Nakagawa, Nobuaki; and Kotani, Kikuo, 4,258,193, Cl. 546-281.000.
Kotera, Noboru; Eguchi, Syusaku; Miyahara, Junji; Matsumoto, Seiji; and Kato, Hisatoyo, to Fuji Photo Film Co., Ltd. Method of and apparatus for reading out a radiation image recorded in a stimulable phosphor. 4,258,264, Cl. 250-484.000.
Koto, Noriaki: *See*—
Tsubaki, Kazumi; Koto, Noriaki; and Maeda, Kouichi, 4,258,167, Cl. 526-128.000.
Koumura, Suketsugu: *See*—
Nishimura, Nobuzi; Tsuji, Masayuki; Konishi, Seizo; Yamamoto, Tadashi; Tokieda, Takemi; Sawa, Utazi; and Koumura, Suketsugu, 4,257,770, Cl. 8-549.000.
Kountz, Kenneth J.; Cooper, Kenneth W.; Abendschein, Frederic H.; and Sumner, Lee E., Jr., to Borg-Warner Corporation. Microcomputer control for an inverter-driven heat pump. 4,257,238, Cl. 62-176.00B.
Kovacs, Gabor: *See*—
Szabo, Tibor; Institoris, Laszlo; Kovacs, Gabor; Dalmadi, Gyula; Koszegi, Bela; and Stadler, Istvan, 4,257,962, Cl. 260-346.220.
Kovacs, Gaborne: *See*—
Mariasi, Bela; Molnar, Laszlo; Toth, Janos; Gulya, Imre; Nagy, Miklos; Wolfram, Ervin; Zrinyi, Miklos; Kovacs, Gaborne; and Jaksity, Laszlone, 4,258,163, Cl. 526-202.000.
Koval, Edmund R., to Columbus McKinnon Corporation. Hook load pin retention system. 4,257,638, Cl. 294-82.00R.
Kraftwerk Union Aktiengesellschaft: *See*—
Trassl, Werner; Purr, Gerhard; and Scheffczyk, Helmut, 4,257,234, Cl. 60-719.000.
Kramer, Horst: *See*—
Dantlgraber, Jorg; Kramer, Horst; and Fischer, Horst, 4,257,750, Cl. 417-270.000.
Kramer, Horst G.: *See*—
Ross, John M.; Gupta, Kedar P.; Kramer, Horst G.; and Burd, John W., 4,257,841, Cl. 156-620.000.
Kramer, Roslyn E.: *See*—
Porter, William L.; and Kramer, Roslyn E., 4,257,776, Cl. 23-230.00M.
Krasnokutsky, Valentin P.: *See*—
Kudryavtsev, Boris B.; Krasnokutsky, Valentin P.; Fedotov, Lev A.; Sholk, Semen F.; Svidler, Jury R.; Zhigarev, Ivan V.; Begunov, Nikolai N.; Kostylev, Valentin F.; Brodsky, Jury M.; and Knyazev, Vadim A., 4,257,888, Cl. 210-97.000.
Krause, Arthur M.: *See*—
Texidor, Julio; Krause, Arthur M.; and Texidor, Patricio, 4,257,389, Cl. 126-113.000.
Krause, Lothar: *See*—
Kleefeldt, Frank; and Krause, Lothar, 4,257,634, Cl. 292-336.300.

Krichten, David J.; and Nicholas, David M., to Air Products and Chemicals, Inc. Process for reabsorption and retention of phosphorous by activated biomass. 4,257,897, Cl. 210-605.000.

Kriese, Eberhard: *See*—
Domer, Michel; and Kriese, Eberhard, 4,257,242, Cl. 64-14.000.

Kronman, Albert F.; and Hensy, Philip E., to Visual Graphics Corporation. Photographic printing apparatus. 4,257,696, Cl. 354-14.000.

Krupke, LeRoy G.: *See*—
Landolt, Christoph A.; and Krupke, LeRoy G., 4,257,201, Cl. 52-118.000.

Krutki, Marian: *See*—
Sedlaczek, Janusz; Krutki, Marian; and Olender, Kornel, 4,257,649, Cl. 299-43.000.

Kubitza, Heinz: *See*—
Bogenschneider, Bernd; Kohling, Rolf; Kubitza, Heinz; Blankmeister, Wilhelm; and Leininger, Dieter, 4,257,879, Cl. 209-5.000.

Kuboyama, Kazuo. Stadium cover. 4,257,199, Cl. 52-2.000.

Kubozuka, Takao: *See*—
Abe, Eiichi; Ogawa, Naoki; Kubozuka, Takao; and Takei, Hirofumi, 4,257,369, Cl. 123-198.00E.

Kucera, Clare H.; and DeMott, Donald N., to Dow Chemical Company, The. Drilling fluid containing crosslinked polysaccharide derivative. 4,257,903, Cl. 252-8.50C.

Kucharczyk, Eckhard, to Siegenia-Frank KG. Room ventilating device. 4,257,319, Cl. 98-37.000.

Kudryavtsev, Boris B.; Krasnokutsky, Valentin P.; Fedotov, Lev A.; Sholk, Semen F.; Svidler, Jury R.; Zhigarev, Ivan V.; Begunov, Nikolai N.; Kostylev, Valentin F.; Brodsky, Jury M.; and Knyazev, Vadim A. Cartridge filter. 4,257,888, Cl. 210-97.000.

Kuehl, Guenter H.: *See*—
Ladov, Edwin N.; Law, Derek A.; and Kuehl, Guenter H., 4,257,775, Cl. 23-230.0HC.

Kuehnle, Manfred R., to Coulter Systems Corporation. Endless belt or cylinder for use with electrostatic imaging and method of making the same. 4,258,113, Cl. 430-94.000.

Kuesters, Werner: *See*—
Fischer, Martin; Kuesters, Werner; Penzel, Erich; Rehder, Wolfgang; and Trautmann, Walter, 4,257,859, Cl. 204-159.230.

Kuhr, Albert F., to United States Gypsum Company. Attachment system for suspended drywall ceiling panels. 4,257,205, Cl. 52-484.000.

Kuki, Kazuo: *See*—
Dairaku, Kazuo; and Kuki, Kazuo, 4,257,257, Cl. 73-19.000.

Kuljis, Andrew M.: *See*—
Scura, Edward D.; Kuljis, Andrew M.; and Courchesne, Roger L., 4,257,351, Cl. 119-4.000.

Kullander, Mats O., to Billeruds Aktiebolag. Coating apparatus with vacuum biased doctor blade. 4,257,343, Cl. 118-50.000.

Kumjian, Alexander A.: *See*—
Straznicky, Joseph; and Kumjian, Alexander A., 4,258,273, Cl. 307-221.00R.

Kummer, Rudolf: *See*—
Platz, Rolf; Kummer, Rudolf; and Schneider, Heinz-Walter, 4,258,203, Cl. 560-204.000.

Kunii, Kazuya: *See*—
Etoh, Yukihiro; Tanaka, Toshiaki; and Kunii, Kazuya, 4,257,372, Cl. 123-198.00F.

Kuno, Takasi: *See*—
Karube, Norio; Morita, Yasuyuki; Yamaka, Eizo; and Kuno, Takasi, 4,258,246, Cl. 219-121.0LW.

Kunz, Oswald: *See*—
Stoll, Dieter; and Kunz, Oswald, 4,258,067, Cl. 426-281.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Obara, Hiroshi; and Kon, Tetuaki, 4,258,259, Cl. 250-338.000.
Obara, Hiroshi; Kon, Tetuaki; and Murayama, Naohiro, 4,258,260, Cl. 250-338.000.

Kurimsky, Albert, to Rowe International, Inc. Readily releasable mechanism for locking a merchandising machine door in open position. 4,257,657, Cl. 312-291.000.

Kurita, Toshiaki, to Tomy Kogyo Co., Inc. Manipulative game. 4,257,601, Cl. 273-115.000.

Kurita, Yoshio; and Shibata, Yukitake, to Yokogawa Electric Works, Ltd. Velocity detecting apparatus. 4,257,275, Cl. 73-861.060.

Kuroda, Yoshiki: *See*—
Ito, Kanichi; Hirayama, Yoshio; and Kuroda, Yoshiki, 4,258,005, Cl. 422-143.000.

Kurz, Erwin: *See*—
Schmidt, Herbert; Kurz, Erwin; Berger, Rudolf; and Pilz, Erich, 4,257,728, Cl. 414-468.000.

Kussy, Frank W., to Gould Inc. Unitized combination starter. 4,258,343, Cl. 335-6.000.

Kusters, Eduard: *See*—
Hartmann, Werner; Kutz, Johannes; and Itgenshorst, Dieter, 4,257,246, Cl. 68-200.000.

Kutz, Johannes: *See*—
Hartmann, Werner; Kutz, Johannes; and Itgenshorst, Dieter, 4,257,246, Cl. 68-200.000.

Kuwagaki, Hiroshi; Hamada, Hiroshi; Takechi, Sadatoshi; and Yano, Kohzo, to Sharp Kabushiki Kaisha. Electrochromic display. 4,257,683, Cl. 350-357.000.

Kwan, Wong K., to Well Men Industrial Co. Limited. Water-driven toothbrush and water-pick assembly. 4,257,433, Cl. 132-11.00A.

Kwee, Kiem T., to IHC Holland N.V. Device for sucking up solid materials or objects. 4,257,723, Cl. 406-49.000.

Kwong, Leung W.: *See*—
Shiu, Chan K.; and Kwong, Leung W., 4,257,448, Cl. 137-460.000.

Kyo, Kayomon; Asahara, Nakaba; Asai, Yasuhiko; Hirose, Isamu; and Kato, Sadao, to Unitika Ltd. Aromatic polyester. 4,258,154, Cl. 525-425.000.

L M Ericsson Pty. Ltd.: *See*—
Herschtal, Ludwik; and Zelenka, Alfred, 4,258,433, Cl. 370-24.000.

Labar, Jacques E., to Morgan Adhesives Co. Laminate with removable scored paper backing. 4,258,092, Cl. 428-40.000.

Labofina S.A.: *See*—
Hanotier, Jacques D. V., 4,258,209, Cl. 562-412.000.

LaBuda, Edward F., to Borg-Warner Corporation. Preloaded torque converter with plug-in flywheel mounting. 4,257,229, Cl. 60-330.000.

La Chance, Ernest J., Sr.: *See*—
Jean, Leonard P.; and La Chance, Ernest J., Sr., 4,258,228, Cl. 174-168.000.

Ladov, Edwin N.; Law, Derek A.; and Kuehl, Guenter H., to Mobil Oil Corporation. Determination of water content in various systems. 4,257,775, Cl. 23-230.0HC.

Laflamme, Daniel. Electronic display device for fretted stringed instruments. 4,257,306, Cl. 84-485.00R.

Laing, Jean W.; and Hubble, Fred F., III, to Xerox Corporation. Corona wire mounting device. 4,258,258, Cl. 250-324.000.

Laing, Stuart B.: *See*—
Humber, David C.; Laing, Stuart B.; and Weingarten, Gordon G., 4,258,183, Cl. 544-22.000.

Lam, Hau C.: *See*—
Lee, Thomas K. P.; and Lam, Hau C., 4,258,358, Cl. 340-543.000.

LaMarche, Frederick W., to Sheldahl, Inc. Composite top membrane for flat panel switch arrays. 4,258,096, Cl. 428-209.000.

Lambers, Edward A.: *See*—
Allen, John K.; Palka, Agnes M.; and Lambers, Edward A., 4,258,227, Cl. 585-469.000.

Landolt, Christoph A.; and Krupke, LeRoy G., to American Hoist & Derrick Company. Self-centering telescoping beams. 4,257,201, Cl. 52-118.000.

Lane, Richard A.; and Fronek, Donald K., to United States of America, Army. Microprocessor controlled digital detector. 4,258,423, Cl. 364-484.000.

Lange, Ludwig: *See*—
Schmid, Josef; Lange, Ludwig; Klebe, Hans; and Schutte, Dieter, 4,258,023, Cl. 423-336.000.

Langguth, Robert P.; and Tryson, Kathie J., to Monsanto Company. Disinfectant cleaning compositions. 4,257,907, Cl. 252-106.000.

Langworthy, Harold F., to Eastman Kodak Company. Film projection gate. 4,257,695, Cl. 353-95.000.

Lanneau, Jacques: *See*—
Delcoigne, Adrien; and Lanneau, Jacques, 4,257,710, Cl. 366-8.000.

Lantz, Karl-Einar: *See*—
Andersson, Gosta A.; Lantz, Karl-Einar; and Akhagen, Rune V., 4,257,330, Cl. 102-100.000.

La Pierre, Rene B.; Shihabi, David S.; and Smith, Robert L., to Mobil Oil Corporation. Low pressure hydrocracking of refractory feed. 4,257,872, Cl. 208-59.000.

Larsen, Arno I. M.: *See*—
De Leon, Noel; Larsen, Arno I. M.; Knudsen, Poul E.; and Jensen, Erik H., 4,258,009, Cl. 422-250.000.

Larson, Daniel A.: *See*—
Michael, Jacob F.; and Larson, Daniel A., 4,258,288, Cl. 315-60.000.

Larson, Roger L.; and Tamsky, Morgan J., to Minnesota Mining and Manufacturing Company. Reduced gloss in pressure-fixing of toner powder. 4,258,095, Cl. 428-172.000.

Lasco, Inc.: *See*—
Dykes, Willis G., 4,257,190, Cl. 47-1.300.

Laugerud, Sverre: *See*—
Etnestad, Hermann; and Laugerud, Sverre, 4,257,336, Cl. 110-245.000.

Launzel, Edward A. Three-dimensional puzzle. 4,257,606, Cl. 273-157.00R.

Laurel Bank Machine Co., Ltd.: *See*—
Uchida, Isamu, 4,257,208, Cl. 53-212.000.

Lauve, Henry d.S., to Electric Fuel Propulsion Corp. Automotive rear view mirror. 4,257,681, Cl. 350-307.000.

Law, Derek A.: *See*—
Ladov, Edwin N.; Law, Derek A.; and Kuehl, Guenter H., 4,257,775, Cl. 23-230.0HC.

Lawrence, Allan K. to Deere & Company. Cutterhead for forage harvesters and the like. 4,257,566, Cl. 241-221.000.

Lawrence, Dan D.; and Felber, Betty J., to Standard Oil Company (Indiana). Formation treatment with silicate activated lignosulfonate gel. 4,257,813, Cl. 106-74.000.

Lawrence, Leo A.: *See*—
Gibby, Ronald L.; Lawrence, Leo A.; Woodley, Robert E.; Wilson, Charles N.; Weber, Edward T.; and Johnson, Carl E., 4,257,847, Cl. 176-68.000.

Lawson, John R.: *See*—
Quan, Peter M.; Hunter, James S.; Lawson, John R.; and Moore, John H., 4,257,944, Cl. 260-207.100.

Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique Cii/Honeywell Bull (Societe Anonyme). Platform having at least one transducer for reading from and/or recording on a data carrier. 4,258,400, Cl. 360-103.000.

Le Van Specialty Co., Inc.: *See*—
DeStepheno, George E., 4,257,632, Cl. 292-263.000.

Leach, Bruce E.; and Starks, Charles M., to Conoco, Inc. Purification of 2,6-xylenol streams. 4,258,220, Cl. 568-804.000.

Leach, John M. Frictionless entry and release sprocket. 4,257,519, Cl. 198-834.000.

Leamy, Harry J.: *See—*
Jackson, Kenneth A.; Kimerling, Lionel C.; and Leamy, Harry J., 4,257,824, Cl. 148-1.500.

Lear Siegler, Inc.: *See—*
Lenz, Vernon C.; Draeger, William H.; and Surprenant, Ronald J., 4,258,231, Cl. 179-18.0FC.

Leblanc, Raymond F.; Taylor, Donald M.; and Hartney, Robert W., to Teledyne Industries, Inc. Method and apparatus for injection molding solid steel-banded press-on industrial rubber tires. 4,257,994, Cl. 264-102.000.

Leccacorvi, John F.: *See—*
Ribaudo, Charles; Leccacorvi, John F.; and Gilbert, Everett E., 4,258,224, Cl. 568-935.000.

Ledbetter, Carl W.: *See—*
Partin, James R.; Bose, James E.; and Ledbetter, Carl W., 4,257,239, Cl. 62-238.700.

Ledermann & Co.: *See—*
Heimbrand, Eberhard, 4,257,302, Cl. 83-839.000.

Lee, Do I.; Harry, Lawrence D.; and Morris, Jack D., to Dow Chemical Company, The. Aqueous polymeric dispersions, paper coating compositions and coated paper articles made therewith. 4,258,104, Cl. 428-342.000.

Lee, Sam S.: *See—*
Karayannis, Nicholas M.; and Lee, Sam S., 4,258,168, Cl. 526-139.000.

Lee, Thomas K. P.; and Lam, Hau C., to International Quartz Ltd. Door opening sensing and alarm producing device. 4,258,358, Cl. 340-543.000.

LeFever, JoAnne: *See—*
Barreiro, Agustin J.; Lowe, Charles M. T.; LeFever, JoAnne; and Pyman, Ronald L., 4,258,012, Cl. 423-8.000.

Legrand, Daniel L. Optical peephole device insertable in thick walls for panoramic viewing therethrough. 4,257,670, Cl. 350-8.000.

Legris, Andre, to Legris Incorporated. Rotary cocks carrying spherical seals. 4,257,576, Cl. 251-315.000.

Legris Incorporated: *See—*
Legris, Andre, 4,257,576, Cl. 251-315.000.

Leif, Robert C., to Coulter Electronics, Inc. Use of fluid retarding ion conducting material. 4,258,316, Cl. 324-71.0CP.

Leinfelt, Karl E., to Aktiebolaget Electrolux. Combination vacuum cleaner and dust container. 4,257,789, Cl. 55-378.000.

Leininger, Dieter: *See—*
Bogenschneider, Bernd; Kohling, Rolf; Kubitza, Heinz; Blankmeister, Wilhelm; and Leininger, Dieter, 4,257,879, Cl. 209-5.000.

Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corp. Inorganic organic coester stabilizers. 4,257,927, Cl. 260-23.0XA.

Lemaire, Francis: *See—*
Guerrini, Jacques; Berthet, Jeanne; Gaussens, Gilbert; and Lemaire, Francis, 4,258,156, Cl. 525-531.000.

Lemarchand, Camille: *See—*
Streichenberger, Rodolphe H., 4,257,350, Cl. 119-3.000.

Lemelson, Jerome H. Molding system and method. 4,257,755, Cl. 425-168.000.

Lemelson, Jerome H.; and Grund, Christian. Video telephone. 4,258,387, Cl. 358-85.000.

Le Naour-Sene, Lyliane, to Essilor International "Cie Generale d'Optique. Method of marking ophthalmic lenses of organic material and lenses so marked. 4,257,692, Cl. 351-159.000.

Lengemann, Robert A.; Thompson, Gregory J.; and Vickers, Anthony G., to UOP Inc. Fluid catalytic cracking process. 4,257,875, Cl. 208-113.000.

Lennington, John W.: *See—*
McDougal, John A.; and Lennington, John W., 4,257,373, Cl. 123-424.000.

Lentsch, Steven E., to Economics Laboratory, Inc. Control of mastitis and compositions therefor. 4,258,056, Cl. 424-303.000.

Lentz, James A., to Xerox Corporation. Metal filled, multi-layered elastomer fuser member. 4,257,699, Cl. 355-3.0FU.

Lenz, Vernon C.; Draeger, William H.; and Surprenant, Ronald J., to Lear Siegler, Inc. Remote line switching extension for telephone exchange. 4,258,231, Cl. 179-18.0FC.

Leonardi, Samuel. Method and apparatus for varying the fuel ratio of an air-fuel mixture. 4,257,362, Cl. 123-392.000.

Lerch, Ulrich: *See—*
Bartmann, Wilhelm; Beck, Gerhard; Lerch, Ulrich; and Bickel, Martin, 4,258,057, Cl. 424-305.000.

Levine, Ralph; and Olechowski, Jerome R., to Cities Service Company. Process for the preparation of tertiary butyl alcohol. 4,258,223, Cl. 568-899.000.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,257,802, Cl. 71-93.000.

Levy, Ralph; and Rhodes, John D., to Microwave Development Labs. Inc. Manifold multiplexers. 4,258,435, Cl. 370-72.000.

Lewis, Arthur J.; and Bernstein, Seymour, to American Cyanamid Company. C6-Modified cyclodextrin sulfate salts as complement inhibitors. 4,258,180, Cl. 536-112.000.

Lewis Engineering Company, The: *See—*
Dubauskas, Thomas A., 4,258,317, Cl. 324-114.000.

Lewis, Eugene J. Poultry decapitating apparatus. 4,257,143, Cl. 17-12.000.

Lewis, Jerry G.: *See—*
Yin, Robert I.; and Lewis, Jerry G., 4,257,816, Cl. 106-208.000.

Liang, Charles C.; and Joshi, Ashok V., to Duracell International Inc. Solid state cells. 4,258,109, Cl. 429-191.000.

Liberacki, Barry D., to Energy Marketing, Inc. Venting system for a fuel-burning heating plant. 4,257,393, Cl. 126-307.00A.

Liberty Carton Company: *See—*
Frohlicher, Stephen G., 4,257,550, Cl. 229-36.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Nutz, Karl-Diether, 4,258,277, Cl. 307-350.000.

Liertz, Heinrich; Oestreich, Ulrich; and Zeidler, Guenter, to Siemens Aktiengesellschaft. Device for measuring the attenuation of optical waves on optical transmission paths. 4,257,707, Cl. 356-73.100.

Lietti, Andrea; and Bonati, Attilio, to Inverni Della Beffa S.p.A. Pharmaceutical compositions. 4,258,055, Cl. 424-283.000.

Lifewell Corporation: *See—*
Hatanaka, Takefumi, 4,257,565, Cl. 241-100.000.

Liggett Group Inc.: *See—*
Collins, Peter F.; Bryant, Herman G., Jr.; and Pullman, James O., 4,257,430, Cl. 131-140.00B.

Lilley, George L.: *See—*
Kauffman, William J.; and Lilley, George L., 4,258,085, Cl. 427-244.000.

Lim, Franklin, to Damon Corporation. Chromatography. 4,257,884, Cl. 210-656.000.

Linde Aktiengesellschaft: *See—*
Jakob, Fritz, 4,257,475, Cl. 165-1.000.
Wernicke, Hans J.; and Mikulla, Klaus D., 4,257,871, Cl. 208-57.000.

Linger, Keith R.: *See—*
Pollock, James F.; Linger, Keith R.; and Hewinson, Vincent K., 4,257,157, Cl. 29-611.000.

Lingl Corporation: *See—*
Mueller, Walter, 4,257,334, Cl. 110-104.00R.

Lipschutz, Paul, to Neiman, S.A. Control device for vehicle locks. 4,258,352, Cl. 340-53.000.

Liu, Cheng-Yih: *See—*
Economy, James; Flandera, Mary Ann; and Liu, Cheng-Yih, 4,258,079, Cl. 427-44.000.

Livermore, David G. H.: *See—*
O'Callaghan, Cynthia H.; Livermore, David G. H.; and Newall, Christopher E., 4,258,041, Cl. 424-246.000.

Loblock, Norton M, to Argo Engineering Ltd. Hold-down device for dockleveller. 4,257,136, Cl. 14-71.300.

Locatell, Louis, Jr.: *See—*
Foley, James W.; Locatell, Louis, Jr.; and Zepp, Charles M., 4,258,118, Cl. 430-221.000.

Loev, Bernard; and Shroff, James R., to USV Pharmaceutical Corporation. Antihypertensive pyridines and compositions. 4,258,042, Cl. 424-248.500.

Logan, Emanuel, Jr., to Reliable Security Systems, Inc.; and Reliable Security Systems, Inc. Magnetic emergency exit door lock with delayed opening. 4,257,631, Cl. 292-251.300.

Lohr & Bromkamp GmbH: *See—*
Welschof, Hans-Heinrich, 4,257,244, Cl. 64-23.000.

Lombard, Gerard, to Essilor International "Cie Generale d'Optique". Hub for mounting a rotary tool. 4,257,197, Cl. 51-168.000.

Lommerzheim, Werner: *See—*
Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, 4,258,006, Cl. 422-146.000.

Long, William G.: *See—*
Johnson, Thomas A.; and Long, William G., 4,257,812, Cl. 106-67.000.

Loose Leaf Metals Co., Inc.: *See—*
Ferrero, Robert I., 4,257,715, Cl. 402-47.000.

Lorents, Donald C.: *See—*
McCusker, Michael V.; Lorents, Donald C.; Hill, Robert M.; and Huestis, Davis L., 4,258,334, Cl. 331-94.50G.

Lorimor, Gary D.: *See—*
Bergquist, Dwight H.; and Lorimor, Gary D., 4,257,790, Cl. 55-379.000.

Lowe, Charles M. T.: *See—*
Barreiro, Agustin J.; Lowe, Charles M. T.; LeFever, JoAnne; and Pyman, Ronald L., 4,258,012, Cl. 423-8.000.

Lucas, George A., to Goodyear Aerospace Corporation. Seal splice. 4,257,837, Cl. 156-153.000.

Lucas, Pierre M.: *See—*
Glowinski, Albert; and Lucas, Pierre M., 4,258,434, Cl. 370-60.000.

Lucifer S.A.: *See—*
Stampfli, Harald, 4,257,573, Cl. 251-30.000.

Ludwig Scheid GmbH Spezialpraparate und Gewurze zur Fleischverarbeitung: *See—*
Stoll, Dieter; and Kunz, Oswald, 4,258,067, Cl. 426-281.000.

Luick, David A.: *See—*
Berglund, Neil C.; and Luick, David A., 4,258,417, Cl. 364-200.000.

Lukaszewicz, Johannes; Muller-Frank, Ulrich; and Reutler, Herbert, to GHT, Gesellschaft fur Hochtemperaturreaktor-Technik mbH. Mixing and distributing device for gases having high temperature. 4,257,845, Cl. 176-58.0PB.

Lundell, Karl E. B.: *See—*
Tisell, Claes-Gustav E. Y.; Lundell, Karl E. B.; Horner, Sven H. N.; Thorstensson, Gustav Y.; and Karlstedt, Gustav S. E., 4,257,315, Cl. 92-26.000.

Lundholm, S. Gunner K. Hot gas engine comprising sealing means around piston rods. 4,257,230, Cl. 60-517.000.

Lupinski, John H.; and Barnes, Wilson J., to General Electric Company. Electrocoating compositions and electrocoating method. 4,257,861, Cl. 204-181.00R.

Lurz, Karl-Heinz: *See—*
Goltner, Ewald; Lurz, Karl-Heinz; and Schneider, Gerhard, 4,257,419, Cl. 128-303.00A.

Lutnick, Edward T., to General Motors Corporation. Disengagement control for a torque converter clutch. 4,257,503, Cl. 192-3.230.

Lyall, Robert W.: *See—*
Hill, Donald C.; and Lyall, Robert W., 4,257,452, Cl. 137-514.700.

Lydall, Inc.: *See—*
Wald, Stephen A., 4,257,791, Cl. 55-382.000.

Lysenko, Zenon: *See—*
Nicolaou, Kyriacos C.; Barnette, William E.; Magolda, Ronald L.; and Lysenko, Zenon, 4,258,199, Cl. 549-51.000.

MAC Valves, Inc.: *See—*
Neff, James A., 4,257,572, Cl. 251-30.000.

MacChesney, John B.: *See—*
Andrejco, Matthew J.; and MacChesney, John B., 4,257,797, Cl. 65-3.00A.

Macchi, Pier G. Negative pressure respirator shells. 4,257,407, Cl. 128-30.200.

MacPherson, Edwin J.; Alderson, Peter J.; and Skinner, Douglas A., to Uniroyal Ltd. Scraper bars for use with conveyor belting and the like. 4,257,517, Cl. 198-497.000.

Maeda, Kouichi: *See—*
Tsubaki, Kazumi; Koto, Noriaki; and Maeda, Kouichi, 4,258,167, Cl. 526-128.000.

Maeda, Yoshiyuki: *See—*
Sakamaki, Hiroshi; Maeda, Yoshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, 4,257,753, Cl. 418-133.000.

Maggs, Peter J.: *See—*
Guy, Kenneth R.; Broom, Terence W.; and Maggs, Peter J., 4,257,734, Cl. 415-115.000.

Magolda, Ronald L.: *See—*
Nicolaou, Kyriacos C.; Barnette, William E.; Magolda, Ronald L.; and Lysenko, Zenon, 4,258,199, Cl. 549-51.000.

Magome, Tamotsu; and Saito, Takashi, to Canon Kabushiki Kaisha. Wet developing method using elastic roller for electrostatic image and a device therefor. 4,258,115, Cl. 430-125.000.

Mahendroo, Rajinder K., to Engelhard Minerals & Chemicals Corporation. Selective hydrogenation process. 4,257,877, Cl. 208-144.000.

Maher, Jack; and Francis, Grosvenor F. Mobile chaff-cutter. 4,257,215, Cl. 56-14.400.

Mahieu, Jean-Rene: *See—*
Bernard, Nicolle; and Mahieu, Jean-Rene, 4,258,339, Cl. 333-1.100.

Mainprice, Peggy L. Scoop device. 4,257,635, Cl. 294-1.0BA.

Mainprice, Peggy L. Bag and bag and scoop device combination. 4,257,636, Cl. 294-1.0BA.

Makabe, Osamu: *See—*
Kai, Fumio; Tsuruoka, Takashi; Makabe, Osamu; Inouye, Shigeharu; Ikeda, Hitoshi; Kazuno, Yuzo; Nakajima, Shokichi; Seki, Shigeo; and Niida, Taro, 4,258,184, Cl. 544-27.000.

Maldonado, Juan R., to Bell Telephone Laboratories, Incorporated. High-power X-ray source. 4,258,262, Cl. 250-419.000.

Malhotra, Sudarshan K.: *See—*
Van Heertum, John C.; and Malhotra, Sudarshan K., 4,258,048, Cl. 424-263.000.

Malick, Franklin S., to Westinghouse Electric Corp. Circuit interrupter with magnetic arc stretcher. 4,258,345, Cl. 335-201.000.

Maljutin, Gennady G.: *See—*
Shirokov, Vasily I.; Maljutin, Gennady G.; Mishiev, Ilyasaf I.; Koshkin, Nikolai N.; Abdullaeva, Farida S.; Stukalenko, Anatoly K.; Novichkov, Alexandr N.; and Saveliev, Jury V., 4,257,794, Cl. 62-28.000.

Malone, Randall P. Animal trap. 4,257,184, Cl. 43-92.000.

Maloney, Timothy, to One Design, Inc. Environmentally driven heating and cooling system. 4,257,477, Cl. 165-48.00S.

Management Operations Limited: *See—*
Unsted, Lionel P., 4,257,177, Cl. 36-77.00R.

Manino, Anthony P.: *See—*
Mittermaier, Gunther, 4,257,622, Cl. 280-605.000.

Mannasseh, Gerald: *See—*
Ashdown, Ronald A.; and Mannasseh, Gerald, 4,257,357, Cl. 122-235.00B.

Mansukhani, Ishwar R., to Whittaker Corporation. Light sensitive jet inks. 4,258,367, Cl. 346-1.100.

Maple, Steven E.; and Mendoza, Enric C., to Rain Bird Sprinkler Mfg. Corp. Flexible conduit repair coupling. 4,257,629, Cl. 285-12.000.

Marathon Electric Manufacturing Corp.: *See—*
Motten, Roger H., Jr., 4,257,662, Cl. 339-186.00R.

Marcal Paper Mills, Inc.: *See—*
Stoveken, F. Raymond, 4,257,294, Cl. 83-374.000.

Mariasi, Bela; Molnar, Laszlo; Toth, Janos; Gulya, Imre; Nagy, Miklos; Wolfram, Ervin; Zrinyi, Miklos; Kovacs, Gaborne; and Jaksity, Laszlone, to Borsodi Vegyi Kombinat. Partially saponified polyvinyl acetates and their application in the homo- and copolymerization of vinyl chloride. 4,258,163, Cl. 526-202.000.

Mark, H. Wayne: *See—*
Roberts, John S.; McKay, Dwight L.; Bertus, Brent J.; and Mark, H. Wayne, 4,257,919, Cl. 252-461.000.

Mark, Victor, to General Electric Company. Process for preparing polycarbonates using isourea catalysts. 4,258,174, Cl. 528-199.000.

Marling, John B.; and Herman, Irving P., to United States of America, Energy. Deuterium enrichment by selective photoinduced dissociation of a multihalogenated organic compound. 4,257,860, Cl. 204-163.00R.

Marquest Medical Products, Inc.: *See—*
Bailey, Donald L., 4,257,426, Cl. 128-766.000.

Marsden, Peter D.: *See—*
Morgan, John; and Marsden, Peter D., 4,258,117, Cl. 430-214.000.

Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. Novel polyhalogenated cyclopropane carboxylic acid derivatives. 4,257,978, Cl. 260-544.00L.

Martel, Jean-Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method of high-speed in particular batch production of aromatic essential oils from perfume-generating plants or from parts thereof such for instance as seeds, bulbs, flowers as well as a device for carrying out this method. 4,257,945, Cl. 260-236.600.

Martin & Pagenstecher GmbH: *See—*
Aller, Walther; Eisermann, Eckehard; Vahlhaus, Dieter; and Konig, Gerd, 4,257,542, Cl. 222-600.000.

Martinek, Karel: *See—*
Berezin, Ilia V.; Goldmakher, Viktor S.; Klibanov, Alexandr M.; Martinek, Karel; Mishin, Alexandr A.; Samokhin, Gennady P.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; and Chazov, Evgeny I., 4,257,269, Cl. 73-606.000.

Martinsson, Christer: *See—*
Gestblom, Barbro; Martinsson, Christer; and Treijner, Hakan, 4,257,170, Cl. 34-48.000.

Martorana, Piero A.: *See—*
Bender, Heinz; Beyerle, Rudi; Piesch, Steffen; and Martorana, Piero A., 4,258,043, Cl. 424-250.000.

Marumoto, Ryuji; Tanabe, Masao; and Furukawa, Yoshiyasu, to Takeda Chemical Industries, Ltd. 2,6-Diaminonebularines. 4,258,033, Cl. 424-180.000.

Marx, Joachim, to Hivolin GmbH. Rotameter with float guide members. 4,257,279, Cl. 73-861.570.

Marzy, Otto: *See—*
Blaimschein, Gottfried; and Marzy, Otto, 4,257,724, Cl. 409-232.000.

Masaki, Katsumi: *See—*
Hirayama, Kazuhiro; Sato, Yasushi; Mochizuki, Noritaka; and Masaki, Katsumi, 4,257,701, Cl. 355-8.000.

Mase, Akira: *See—*
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,258,307, Cl. 322-28.000.

Mason, Stanley I., Jr. Content indicating dispenser utilizing displacement of the center of gravity of the contents and the dispenser to provide an indication of the quantity of contents remaining in the dispenser. 4,257,558, Cl. 239-57.000.

Massachusetts Institute of Technology: *See—*
Howland, Bradford, 4,257,690, Cl. 351-32.000.
Hsieh, Jaw J.; and Hurwitz, Charles E., 4,258,375, Cl. 357-16.000.

Massino, Chester F., to Ideas That Sell, Inc. Ball and method of making same. 4,257,598, Cl. 273-60.00R.

Masuda, Takao: *See—*
Ikenoue, Shinpei; Suzuki, Yoshiaki; and Masuda, Takao, 4,258,129, Cl. 430-620.000.

Masunaga, Makoto: *See—*
Hosoe, Kazuya; Niwa, Yukichi; Tsunekawa, Tokuichi; Owada, Mitsutoshi; Asano, Noriyuki; and Masunaga, Makoto, 4,257,705, Cl. 356-1.000.

Matalone, Samuel, Jr., to Texas Instruments Incorporated. Photoresist masking in manufacture of semiconductor device. 4,257,826, Cl. 148-1.500.

Mathur, Krishna K.; and Rush, Olinda W., to Pfizer Inc. Method of reducing binder demand of inorganic filler. 4,257,817, Cl. 106-266.000.

Mathus, Gregory: *See—*
Yonkers, Edward H.; Stenfors, Alan; and Mathus, Gregory, 4,257,524, Cl. 211-71.000.

Matos, Eliseo J.: *See—*
Matos, R. Jay; Matos, Eliseo J.; and Blaik, Robert, 4,257,988, Cl. 264-1.100.

Matos, R. Jay; Matos, Eliseo J.; and Blaik, Robert, to Optical Warehouse Showroom and Manufacturing, Inc. Method and assembly for molding optical lenses. 4,257,988, Cl. 264-1.100.

Matrick, Howard, to Du Pont de Nemours, E. I., and Company. Two-step milling process for preparing pigmentary copper phthalocyanine. 4,257,951, Cl. 260-314.500.

Matsui, Takeshi; Kohama, Tokio; Kawai, Hisasi; Nishimatsu, Akira; Ina, Toshikazu; Nohira, Hidetaka; and Kobashi, Kiyoshi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Electronic control system for internal combustion engines. 4,257,382, Cl. 123-571.000.

Matsumoto, Hiromitsu; and Yamada, Minoru, to Yamaha Hatsukoki Kabushiki Kaisha. Method of controlling internal combustion. 4,257,374, Cl. 123-432.000.

Matsumoto, Hiromitsu, to Yamaha Hatsukoki Kabushiki Kaisha. Intake control apparatus of engine. 4,257,384, Cl. 123-575.000.

Matsumoto, Kojiro: *See—*
Sekiguchi, Sadao; Matsumoto, Kojiro; Ishikawa, Tetsuo; Mishiba, Saburo; and Izaki, Nobujiro, 4,257,935, Cl. 260-29.70H.

Matsumoto, Masakazu; and Nishide, Katsuhiko, to Canon Kabushiki Kaisha. Hologram and method of production thereof with photocrosslinkable polymers. 4,258,111, Cl. 430-2.000.

Matsumoto, Seiji: *See—*
Kotera, Noboru; Eguchi, Syusaku; Miyahara, Junji; Matsumoto, Seiji; and Kato, Hisatoyo, 4,258,264, Cl. 250-484.000.

Matsumoto, Shuntetsu: *See*—
Shigeta, Kiyoko; Matsumoto, Shuntetsu; Ooyama, Naotake; and Imai, Takashi, 4,258,351, Cl. 340-38.00P.
Matsumoto, Yasuji; Murai, Bunjiro; and Kawamura, Reeko. Self-bonding silicone compositions. 4,257,936, Cl. 260-37.0SB.
Matsumura, Isao, to Canon Kabushiki Kaisha. Eye examining instrument. 4,257,688, Cl. 351-7.000.
Matsuoka, Kajio: *See*—
Fujitani, Takeo; and Matsuoka, Kajio, 4,258,100, Cl. 428-315.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Karube, Norio; Morita, Yasuyuki; Yamaka, Eizo; and Kuno, Takasi, 4,258,246, Cl. 219-121.0LW.
Sekine, Yoichi; Kishimoto, Yoshio; and Shimotsuma, Wataru, 4,258,371, Cl. 346-140.00R.
Sonoda, Nobuo; Shimotsuma, Wataru; Kishimoto, Yoshio; and Sekine, Yoichi, 4,258,080, Cl. 427-82.000.
Matsuura, Fumio: *See*—
Hagiwara, Seisaku; and Matsuura, Fumio, 4,258,369, Cl. 346-62.000.
Matsuura, Ryo; Sakai, Kazuaki; Sato, Tuneyasu; Yamada, Yorinobu; and Bandow, Kowzo, to Kawasaki Kasei Chemicals Ltd. Purification of naphthoquinone. 4,257,851, Cl. 203-31.000.
Matsuyama, Kiyoshi; Ishikawa, Shozi; Hirata, Seizi; and Ogura, Tsutomu, to Sumitomo Chemical Company, Limited. Method of discharging slurry by varying valve openings. 4,257,533, Cl. 222-1.000.
Matthijsse, Pieter, to De Staat der Nederlanden, Te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegraphie en Telefonie. Device for coupling at least three light guides. 4,257,673, Cl. 350-96.190.
Mausser, Victor. Telescoping, tiltable light fixture. 4,258,413, Cl. 362-287.000.
Mautz, Karlheinz: *See*—
Schwarz, Alois; and Mautz, Karlheinz, 4,257,738, Cl. 416-134.00A.
Mavilia, Robert A.: *See*—
Pepicelli, Pasquale L.; and Mavilia, Robert A., 4,257,268, Cl. 73-425.600.
Maximov, Ivan V.: *See*—
Semashko, Andrei P.; Gimaev, Nasikh Z.; Maximov, Ivan V.; Bezrukov, Sergei V.; and Rabinovich, Vladimir B., 4,257,865, Cl. 204-224.00M.
May, Christian: *See*—
Elsner, Georg; Klose, Werner; May, Christian; and Heymer, Gero, 4,258,022, Cl. 423-299.000.
Mayeaux, Donald P., to Bi-M Instrument Company. Apparatus for producing calibration gases suitable for analytical instrumentation. 4,257,439, Cl. 137-88.000.
Mazer Corporation, The: *See*—
Panken, Irving; Radow, Robert S.; and Briddell, Brian J., 4,257,329, Cl. 101-473.000.
McClendon, Jimmy R. Apparatus and process for field harvesting of peppers. 4,257,217, Cl. 56-327.00R.
McCusker, Michael V.; Lorents, Donald C.; Hill, Robert M.; and Huestis, Davis L., to SRI International. Noble gas-halogen transfer laser method and means. 4,258,334, Cl. 331-94.50G.
McDermott, Robert H., to Solid Waste Engineering Limited. Refuse compactor. 4,257,322, Cl. 100-229.00A.
McDonald, Ray S.; and Rossing, Martin A., to Medtronic, Inc. Medical device. 4,257,423, Cl. 128-419.0PG.
McDonnell, Damien G.: *See*—
Gray, George W.; and McDonnell, Damien G., 4,257,911, Cl. 252-299.000.
McDougal, John A.; and Lennington, John W., to McDougal, John A. Internal combustion engine ignition system. 4,257,373, Cl. 123-424.000.
McGuire, Danny C. Foldable barbecue. 4,257,388, Cl. 126-26.000.
McGuire, Francis G. End of paper indicator for typewriters. 4,257,712, Cl. 400-708.000.
McKay, Dwight L., to Phillips Petroleum Company. Passivation of metals contaminating a cracking catalyst with trihydrocarbylantimony oxide and process for converting hydrocarbons. 4,257,876, Cl. 208-120.000.
McKay, Dwight L.: *See*—
Roberts, John S.; McKay, Dwight L.; Bertus, Brent J.; and Mark, H. Wayne, 4,257,919, Cl. 252-461.000.
McKellin, Wilbur H., to Pennwalt Corporation. Compounds by addition of hydroperoxides to α-β-unsaturated ketones. 4,257,985, Cl. 568-308.000.
McKenzie, Rebecca Lee Schmitz: *See*—
Schmitz, John N., Sr., 4,257,611, Cl. 273-293.000.
McKinney, James C., to Ethyl Products Company. Child-resistant dispensing nozzle assembly. 4,257,561, Cl. 239-581.000.
McLamb, Philip. Portable protective device. 4,258,359, Cl. 340-546.000.
McLaughlin, Alexander; Richter, Reinhard H.; and Reymore, Harold E., Jr., to Upjohn Company, The. Process for preparing particle board and polyisocyanate-phosphorus compound release agent composition therefor. 4,257,995, Cl. 264-122.000.
McLaughlin, Alexander: *See*—
Farrissey, William J., Jr.; McLaughlin, Alexander; Richter, Reinhard H.; Smith, Curtis P.; and Tucker, Benjamin W., 4,257,996, Cl. 264-122.000.
McNeil Corporation: *See*—
Wegmann, Jerome B.; and Cook, Norbert F., 4,257,540, Cl. 222-262.000.
McQuaid, Phillip T.: *See*—
Conrey, Richard N.; McQuaid, Phillip T.; and Yursis, Paul J., 4,257,594, Cl. 273-29.00A.
McQuay-Perfex Inc.: *See*—
Johannsen, James R., 4,257,318, Cl. 98-1.500.
McRobert, Leon R., to FMC Corporation. Harvester for vegetable crops such as tomatoes or the like. 4,257,218, Cl. 56-327.00R.
Mead Corporation, The: *See*—
Nodov, Eugene, 4,258,395, Cl. 358-293.000.
Paranjpe, Suresh C., 4,258,370, Cl. 346-75.000.
Scott, Burton W., 4,258,396, Cl. 358-293.000.
Mead Johnson & Company: *See*—
Ullman, Michael K.; David, Stephen T.; and Gallian, Claude E., 4,258,027, Cl. 424-15.000.
Medtronic, Inc.: *See*—
Dickhudt, Eugene A.; and Zytkovicz, Duane J., 4,257,429, Cl. 128-786.000.
McDonald, Ray S.; and Rossing, Martin A., 4,257,423, Cl. 128-419.0PG.
Mehl, Jack J., to Becton, Dickinson and Company. Preservation of urine specimens. 4,258,032, Cl. 424-148.000.
Meiji Seika Kaisha Ltd.: *See*—
Kai, Fumio; Tsuruoka, Takashi; Makabe, Osamu; Inouye, Shigeharu; Ikeda, Hitoshi; Kazuno, Yuzo; Nakajima, Shokichi; Seki, Shigeo; and Niida, Taro, 4,258,184, Cl. 544-27.000.
Meiller, Francois: *See*—
Mirabel, Bernard; and Meiller, Francois, 4,258,133, Cl. 435-176.000.
Meininghaus, Fritz: *See*—
Meurer, Peter; Hater, Martin; Meininghaus, Fritz; and Scheel, Rudiger, 4,257,898, Cl. 210-751.000.
Meisel, Thomas C., Jr.; and Stedman, Robert N., to Caterpillar Tractor Co. Track assembly for track-type vehicles with dual link assemblies. 4,257,653, Cl. 305-28.000.
Mejia, Oscar: *See*—
Alvarez, Mario Y.; and Mejia, Oscar, 4,258,110, Cl. 429-188.000.
Melby, Allan L.: *See*—
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Mellett, Lee T., to Wrightcel, Ltd. Container for liquid having a heat sealable collar for filling the container and receiving a dispensing mechanism. 4,257,535, Cl. 222-92.000.
Mellinger, Gary A.: *See*—
Holub, Fred F.; and Mellinger, Gary A., 4,258,155, Cl. 525-431.000.
Meloy Laboratories, Inc.: *See*—
Richardson, Carol L.; and Schulman, Gail E., 4,257,774, Cl. 23-230.00B.
Menconi, Augusto: *See*—
Piccardi, Paolo; Corda, Francesco; Gozzo, Franco; and Menconi, Augusto, 4,258,202, Cl. 560-124.000.
Mendoza, Enric C.: *See*—
Maple, Steven E.; and Mendoza, Enric C., 4,257,629, Cl. 285-12.000.
Menegatto, Carlo, to O.M.M. Officine Meccaniche Menegatto S.p.A. Shock-isolating, movable mounting for textile machine spindles. 4,257,220, Cl. 57-89.000.
Merck & Co., Inc.: *See*—
Christensen, Burton G.; and Ratcliffe, Ronald W., 4,258,040, Cl. 424-246.000.
Engelhardt, Edward L.; and Remy, David C., 4,258,211, Cl. 564-379.000.
Gibilisco, Kenneth J., 4,257,417, Cl. 128-233.000.
Poe, Martin; and Ruyle, William V., 4,258,045, Cl. 424-251.000.
Racciato, Joseph S.; and Yin, Robert I., 4,257,768, Cl. 8-561.000.
Yin, Robert I.; and Lewis, Jerry G., 4,257,816, Cl. 106-208.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Gante, Joachim; Radunz, Hans-Eckart; Orth, Dieter; Minck, Klaus; Wild, Albrecht; and Klockow, Michael, 4,258,047, Cl. 424-250.000.
Jonas, Rochus; Becker, Karl-Heinz; Enenkel, Hans-Joachim; Minck, Klaus; and Schliep, Hans-Jochen, 4,258,062, Cl. 424-330.000.
Merit Plastics, Inc.: *See*—
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Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Hohmann, Claus; and Gluck, Wolfgang, 4,257,520, Cl. 206-3.000.
Schwarz, Alois; and Mautz, Karlheinz, 4,257,738, Cl. 416-134.00A.
Meszaros, Lajos: *See*—
Rozsa, Laszlo; Meszaros, Lajos; and Mogyorodi, Ferenc, 4,258,010, Cl. 422-257.000.
Metal Box Limited: *See*—
Flaherty, John, 4,258,245, Cl. 219-81.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Hiller, Heinz; Schlauer, Johann; Doerges, Alexander; Kempf, Georg; Svoboda, Vaclav; and Zeschmar, Winfried, 4,258,019, Cl. 423-223.000.
Meunier, Henry E. Device for use in the study of biochemical or enzymatic reactions. 4,258,135, Cl. 435-301.000.
Meurer, Peter; Hater, Martin; Meininghaus, Fritz; and Scheel, Rudiger, to Uhde GmbH. Method of processing waste sludge from wet phosphoric acid purification facilities. 4,257,898, Cl. 210-751.000.
Meyer, Max F., Jr.: *See*—
Dombroski, John R.; and Meyer, Max F., Jr., 4,258,143, Cl. 525-64.000.
Meyer Thor Straten, Peter. Dart and dartboard therefor. 4,257,613, Cl. 273-347.000.

Michael, Jacob F.; and Larson, Daniel A., to Westinghouse Electric Corp. Resistor-aided starting of metal halide lamps. 4,258,288, Cl. 315-60.000.
Michael, Jacob F., to Westinghouse Electric Corp. Metal halide lamp for operation with a mercury ballast. 4,258,289, Cl. 315-60.000.
Michael, Melvin D.: *See*—
Paranay, Bruce J.; and Michael, Melvin D., 4,257,460, Cl. 141-26.000.
Michener, Thomas S., Jr. Preparation of a non-fat naturally sweet yogurt. 4,258,064, Cl. 426-43.000.
Mickelsson, Seve-Mikael; and Hall, Sture R., to AB Issesunds Bruk. Tractor-drawn seeding apparatus. 4,257,340, Cl. 111-1.000.
Microwave Development Labs. Inc.: *See*—
Levy, Ralph; and Rhodes, John D., 4,258,435, Cl. 370-72.000.
Middleton, William J., to Du Pont de Nemours, E. I., and Company. Process for preparing quinazolinone oxides. 4,258,187, Cl. 544-286.000.
Mieno, Kazunori: *See*—
Tanimura, Shozo; Saito, Yasuhisa; Horiuchi, Hiroshi; Mieno, Kazunori; Nakao, Shinji; Nakano, Takaaki; and Kamei, Kenzo, 4,257,926, Cl. 260-3.000.
Mieyal, David F., to Donn Incorporated. Fire rated ceiling. 4,257,206, Cl. 52-573.000.
Mikulla, Klaus D.: *See*—
Wernicke, Hans J.; and Mikulla, Klaus D., 4,257,871, Cl. 208-57.000.
Miles, Gregory M., to Honeywell Inc. Fuel burner primary control means. 4,257,759, Cl. 431-31.000.
Miller, Bertram W. Apparatus for ascertaining color balance of photographic printing paper. 4,257,702, Cl. 355-71.000.
Miller, Donald V. Bulk catalyst proportioner. 4,257,438, Cl. 137-88.000.
Miller, John H. Method and apparatus for selective recovery of metal containers. 4,257,511, Cl. 194-4.00R.
Miller, Richard J.; Chang, Kwen-Jen; and Cuatrecasas, Pedro, to Burroughs Wellcome Co. Assay method and compounds. 4,257,773, Cl. 23-230.00B.
Miller, Richard L.: *See*—
Clements, Nicholas; and Miller, Richard L., 4,257,138, Cl. 15-4.000.
Miller, Taylor C., Jr., to Cameo, Inc. Method for reducing dental plaque and pellicle precursor of plaque. 4,258,028, Cl. 424-49.000.
Milligan, Barton; and Huang, Der-Shing, to Air Products and Chemicals, Inc. Process for refining aqueous acid mixtures utilized in nitration of aromatics. 4,257,986, Cl. 568-934.000.
Mills, Norman T., to Inland Steel Company. Continuous casting shroud apparatus and method. 4,257,473, Cl. 164-82.000.
Mills, Peter S.: *See*—
Kellet, William H.; and Mills, Peter S., 4,257,814, Cl. 106-90.000.
Minagawa, Motonobu: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,257,927, Cl. 260-23.0XA.
Minck, Klaus: *See*—
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Jonas, Rochus; Becker, Karl-Heinz; Enenkel, Hans-Joachim; Minck, Klaus; and Schliep, Hans-Jochen, 4,258,062, Cl. 424-330.000.
Mindin, Vladimir M.: *See*—
Popov, Alexandr D.; Solomin, Vladimir A.; and Mindin, Vladimir M., 4,258,278, Cl. 310-13.000.
Mine Safety Appliances Company: *See*—
Heller, Herbert; and Schmitt, Paul W., 4,258,230, Cl. 179-17.00A.
Ministry of International Trade & Industry: *See*—
Shigeta, Kiyoko; Matsumoto, Shuntetsu; Ooyama, Naotake; and Imai, Takashi, 4,258,351, Cl. 340-38.00P.
Minnesota Mining and Manufacturing Company: *See*—
Duncan, Patricia E., 4,257,422, Cl. 128-350.00R.
Knowd, Michael J., 4,257,273, Cl. 73-647.000.
Larson, Roger L.; and Tamsky, Morgan J., 4,258,095, Cl. 428-172.000.
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Yamazaki, Keiji; and Kobori, Toshio, 4,257,697, Cl. 354-152.000.
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Mishiev, Ilyasaf I.: *See*—
Shirokov, Vasily I.; Maljutin, Gennady G.; Mishiev, Ilyasaf I.; Koshkin, Nikolai N.; Abdullaeva, Farida S.; Stukalenko, Anatoly K.; Novichkov, Alexandr N.; and Saveliev, Jury V., 4,257,794, Cl. 62-28.000.
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Berezin, Ilia V.; Goldmakher, Viktor S.; Klibanov, Alexandr M.; Martinek, Karel; Mishin, Alexandr A.; Samokhin, Gennady P.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; and Chazov, Evgeny I., 4,257,269, Cl. 73-606.000.
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Dickert, Joseph J., Jr.; Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,257,869, Cl. 208-8.0LE.
Mitsubishi Chemical Industries Ltd.: *See*—
Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; Kitada, Hisashi; and Uehara, Yumito, 4,258,161, Cl. 526-153.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,258,192, Cl. 546-166.000.
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Abe, Kenji; Tsuge, Ayao; Hirao, Yasuhiko; Hori, Keiichi; and Isono, Masamichi, 4,257,819, Cl. 134-19.000.
Kimishima, Makoto; and Shinoda, Naoharu, 4,257,793, Cl. 55-394.000.
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Kato, Nobukatsu; Takase, Tsutomu; and Morimoto, Yoshio, 4,258,219, Cl. 568-771.000.
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Gillette, John E.; and Mittelberg, Mark S., 4,257,354, Cl. 119-72.500.
Mittermaier, Gunther, to Manino, Anthony P. Ski stop assembly. 4,257,622, Cl. 280-605.000.
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Miyajima, Hajime; and Nakakura, Akio, to Toko, Inc. Elastic surface wave device. 4,258,342, Cl. 333-151.000.
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Eguchi, Hajime; Furukawa, Hideko; Miyanishi, Toshiaki; and Sakaguchi, Makoto, 4,258,072, Cl. 426-537.000.
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Mo och Domsjo Aktiebolag: *See*—
Goltner, Ewald; Lurz, Karl-Heinz; and Schneider, Gerhard, 4,257,419, Cl. 128-303.00A.
Hessner, Hans, 4,257,418, Cl. 128-286.000.
Moba Holding Barneveld B.V.: *See*—
van Brummelen, Johannes, 4,257,141, Cl. 17-11.000.
Mobil Oil Corporation: *See*—
Canterino, Peter J.; and Allen, Craig E., 4,258,166, Cl. 526-348.100.
Dwyer, Francis G.; and Schwartz, Albert B., 4,258,218, Cl. 568-698.000.
Ladov, Edwin N.; Law, Derek A.; and Kuehl, Guenter H., 4,257,775, Cl. 23-230.0HC.
La Pierre, Rene B.; Shihabi, David S.; and Smith, Robert L., 4,257,872, Cl. 208-59.000.
Strong, Jerry G., 4,258,038, Cl. 424-222.000.
Mochizuki, Noritaka: *See*—
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Moebius, Kurt O., to Hackforth GmbH & Co. KG. Assembly tool for tube fittings. 4,257,135, Cl. 7-125.000.
Mogensen, Fredrik K., to Kommanditbolaget Fredrik Mogensen & Co. Method of pre-concentrating heterogeneous mineral mixtures. 4,257,882, Cl. 209-268.000.
Mogyorodi, Ferenc: *See*—
Rozsa, Laszlo; Meszaros, Lajos; and Mogyorodi, Ferenc, 4,258,010, Cl. 422-257.000.
Mohring, Edgar; Muller, Hanns P.; and Wagner, Kuno, to Bayer Aktiengesellschaft. Process for the production of low molecular weight polyhydroxyl compounds. 4,258,222, Cl. 568-863.000.
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Cook, Sanford L.; and Molisani, Justin J., 4,257,445, Cl. 137-341.000.
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Molnar, Laszlo: *See*—
Mariasi, Bela; Molnar, Laszlo; Toth, Janos; Gulya, Imre; Nagy, Miklos; Wolfram, Ervin; Zrinyi, Miklos; Kovacs, Gaborne; and Jaksity, Laszlone, 4,258,163, Cl. 526-202.000.
Moloney, Peter J.; and Wojcik, George, to Connaught Laboratories Limited. Synthetic adjuvants for stimulation of antigenic responses. 4,258,029, Cl. 424-88.000.
Momiyama, Kikuo; and Yokota, Hideo, to Canon Kabushiki Kaisha. Wide angle photographic lens. 4,257,678, Cl. 350-465.000.

Monaco, Rosemarie. Combination carrying cases. 4,257,463, Cl. 150-35.000.
Monsanto Company: *See*—
Chupp, John P.; and Goodin, Richard D., 4,258,196, Cl. 548-165.000.
Crutchfield, Marvin M., 4,257,906, Cl. 252-99.000.
Langguth, Robert P.; and Tryson, Kathie J., 4,257,907, Cl. 252-106.000.
Ross, John M.; Gupta, Kedar P.; Kramer, Horst G.; and Burd, John W., 4,257,841, Cl. 156-620.000.
Montedison S.p.A.: *See*—
Ciaccia, Vittorio; and Parrini, Paolo, 4,257,842, Cl. 162-117.000.
Piccardi, Paolo; Corda, Francesco; Gozzo, Franco; and Menconi, Augusto, 4,258,202, Cl. 560-124.000.
Month, Alfred; and Kaiser, Donald B., to RCA Corporation. Electron tube having electrode centering means. 4,258,284, Cl. 313-390.000.
Mooradian, Aram, to Sterling Drug Inc. 3-Amino-tetrahydrocarbazoles. 4,257,952, Cl. 260-315.000.
Moore Business Forms, Inc.: *See*—
Allen, Robert H.; and Gould, Alan M., 4,257,627, Cl. 283-66.00R.
Moore, John H.: *See*—
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Moore, Timothy A.: *See*—
Thur, Gerry W.; and Moore, Timothy A., 4,257,745, Cl. 417-18.000.
Moraru, Dino S., to Institutul de Cergetari in Constructii si Economia Constructilor Incerc. Method for the protection of concrete in sea water. 4,258,090, Cl. 427-386.000.
Morch, Hans H. Tone arm. 4,257,615, Cl. 369-244.000.
Morgan Adhesives Co.: *See*—
Labar, Jacques E., 4,258,092, Cl. 428-40.000.
Morgan, John; and Marsden, Peter D., to Eastman Kodak Company. Dye image reversal processes and image transfer film units. 4,258,117, Cl. 430-214.000.
Mori, Haruhisa; and Nakano, Motoo, to Fujitsu Limited. Method of ion implantation into a semiconductor substrate provided with an insulating film. 4,258,077, Cl. 427-38.000.
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Morikawa, Masanobu: *See*—
Yomamoto, Yoshiyuki; Yoshioka, Akira; and Morikawa, Masanobu, 4,258,153, Cl. 525-397.000.
Morikawa, Tadayuki: *See*—
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Morimoto, Hiroshi: *See*—
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Morimoto, Yoshio: *See*—
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Morishita, Teru; and Kazaoka, Manabu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Gas turbine engine with fuel-air premix chamber. 4,257,235, Cl. 60-736.000.
Morishita, Teru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Liquid atomizing device. 4,257,236, Cl. 60-745.000.
Morissette, Gilles. Hand truck. 4,257,729, Cl. 414-490.000.
Morita, Yasuyuki: *See*—
Karube, Norio; Morita, Yasuyuki; Yamaka, Eizo; and Kuno, Takasi, 4,258,246, Cl. 219-121.0LW.
Moriuchi, Yasuhiro: *See*—
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Moriyama, Hideki: *See*—
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Morozumi, Shinji: *See*—
Asakawa, Tatsushi; and Morozumi, Shinji, 4,258,310, Cl. 323-281.000.
Morris, Earl F.; Free, Dustin L.; Root, Roland L.; and Griffin, Thomas J., Jr., to Dow Chemical Company, The. Method of well completion with casing gel. 4,257,483, Cl. 166-292.000.
Morris, Jack D.: *See*—
Lee, Do I.; Harry, Lawrence D.; and Morris, Jack D., 4,258,104, Cl. 428-342.000.
Morris, John W., Jr.; and Niikura, Masakazu, to United States of America, Energy. Low Mn alloy steel for cryogenic service and method of preparation. 4,257,808, Cl. 75-123.00N.
Moss, Alfred W., to White Consolidated Industries, Inc. Overload clutch for the feed roll of a carding machine. 4,257,147, Cl. 19-0.200.
Mostyn, William T., Jr., to Helena Laboratories Corporation. Automatic blanking circuit. 4,257,709, Cl. 356-435.000.
Motten, Roger H., Jr., to Marathon Electric Manufacturing Corp. Fuseholder with separate reject spring having integral spreading and collapsing control means. 4,257,662, Cl. 339-186.00R.
Mount, Gordon L.: *See*—
Bandukwalla, Phiroze; Mount, Gordon L.; and Kirtland, Howard W., 4,257,733, Cl. 415-13.000.
Moy, David, to Halcon Research and Development Corp. Process for the manufacture of carbamates. 4,258,201, Cl. 560-24.000.
Mrowca, Joseph J., to Du Pont de Nemours, E. I., and Company. Process of making acids or esters from unsaturated compounds. 4,257,973, Cl. 260-410.90R.
Mueller, Gerhard: *See*—
Jarre, Wolfgang; Mueller, Gerhard; Zipp, Otmar; and Ropte, Eckhard, 4,258,141, Cl. 521-114.000.
Mueller, Walter, to Lingl Corporation. Apparatus and method for regulating the distribution of granulate. 4,257,334, Cl. 110-104.00R.
Mulach, Arthur: *See*—
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Muller-Frank, Ulrich: *See*—
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Muller, Hanns P.: *See*—
Mohring, Edgar; Muller, Hanns P.; and Wagner, Kuno, 4,258,222, Cl. 568-863.000.
Munroe, Ronald G., to Eagle Electric Mfg. Co., Inc. Screw socket for an electric lamp. 4,257,664, Cl. 339-95.00D.
Murai, Bunjiro: *See*—
Matsumoto, Yasuji; Murai, Bunjiro; and Kawamura, Reeko, 4,257,936, Cl. 260-37.0SB.
Murai, Yosiichi, to Kai Cutlery Center Co., Ltd. Two-bladed safety razor. 4,257,160, Cl. 30-41.000.
Murakami, Tadashi; Yamane, Mamoru; Tokairin, Toshio; and Kawai, Kenji, to Nihon Kogyo Kabushiki Kaisha. Process for producing synthetic coking coal of high volatile matter content. 4,257,778, Cl. 44-1.00R.
Murayama, Naohiro: *See*—
Obara, Hiroshi; Kon, Tetuaki; and Murayama, Naohiro, 4,258,260, Cl. 250-338.000.
Murayama, Toshihiro: *See*—
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Murdock, Forrest L. Low gravity crude oil and water separator. 4,257,895, Cl. 210-243.000.
Murdock, Keith C.; and Durr, Frederick E., to American Cyanamid Company. Substituted 9,10-anthracenebishydrazones. 4,258,181, Cl. 542-415.000.
Muschner, Udo; and Schnurrenberger, Emil, to Stopinc Aktiengesellschaft. Three-plate slide valve closure for liquid melt containers. 4,257,543, Cl. 222-600.000.
Musto, Richard L., to Combustion Engineering, Inc. Multiple jet coal burner. 4,257,761, Cl. 431-174.000.
Muto, Katsuya: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,258,307, Cl. 322-28.000.
Muzik, Vladimir, to Statni banka ceskoslovenska. Apparatus for defacing paper money and similar securities. 4,257,300, Cl. 83-620.000.
Nagai, Nobuo, to Mitsubishi Denki Kabushiki Kaisha. Lightning arrester device for power transmission line. 4,258,407, Cl. 361-117.000.
Nagai, Yohei; and Okamoto, Shimaji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of partials synthesis type. 4,257,303, Cl. 84-1.220.
Nagashima, Akira; and Sato, Shigeru, to Fuji Photo Film Co., Ltd. Photosensitive resin composition. 4,258,123, Cl. 430-281.000.
Nagashima, Yoshitake; Noyori, Kazumasa; and Moriyama, Hideki, to Tokyo Shibaura Denki Kabushiki Kaisha. Double balance type switching circuit. 4,258,274, Cl. 307-254.000.
Nagata, Minoru: *See*—
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Nagy, Miklos: *See*—
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Nakagawa, Nobuaki: *See*—
Fujii, Tadashiro; Nakagawa, Nobuaki; and Kotani, Kikuo, 4,258,193, Cl. 546-281.000.
Nakagawa, Yoshichika, to Yuasa Battery Company Limited. Storage battery with vent and filling control means in cover. 4,258,107, Cl. 429-78.000.
Nakagome, Yukio; Niiro, Yasuhiko; Wakabayashi, Hiroharu; and Nunokawa, Makoto, to Kokusai Denshin Denwa Kabushiki Kaisha. Optical-fiber submarine cable and manufacturing method thereof. 4,257,675, Cl. 350-96.230.
Nakahara, Yutaka: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,257,927, Cl. 260-23.0XA.
Nakajima, Hisaharu, to Toa Harbor Works Co., Ltd. Pile driving method. 4,257,722, Cl. 405-248.000.
Nakajima, Shokichi: *See*—
Kai, Fumio; Tsuruoka, Takashi; Makabe, Osamu; Inouye, Shigeharu; Ikeda, Hitoshi; Kazuno, Yuzo; Nakajima, Shokichi; Seki, Shigeo; and Niida, Taro, 4,258,184, Cl. 544-27.000.
Nakajima, Yoshihisa: *See*—
Tanaka, Akio; Nakajima, Yoshihisa; and Yokomori, Shinji, 4,257,435, Cl. 133-3.00R.
Nakajima, Yoshinori, to Ricoh Company, Ltd. Proportional spacing impact printing apparatus. 4,257,711, Cl. 400-306.000.

Nakajima, Yukio, to Olympus Optical Co., Ltd. Operation indicator for auto-strobo unit. 4,258,290, Cl. 315-135.000.
Nakajima, Yukio, to Olympus Optical Co., Ltd. Voltage indicator for a stroboscope. 4,258,297, Cl. 315-241.00P.
Nakakura, Akio: *See*—
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Nakamura, Masato: *See*—
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Nakano, Takaaki: *See*—
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Nakao, Shinji: *See*—
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Nakao, Toru; Setoguchi, Shinro; and Yaoka, Osamu, to Yoshitomi Pharmaceutical Industries, Ltd. Pyridazinone compounds. 4,258,185, Cl. 544-114.000.
Nakatani, Akira: *See*—
Ikeda, Yorifumi; Nakatani, Akira; and Tsujimcto, Yasuhiro, 4,257,896, Cl. 210-268.000.
Nakayama, Kazuaki, to Pioneer Electronic Corporation. Differential amplifier. 4,258,331, Cl. 330-261.000.
Nakazawa, Terutada: *See*—
Kimura, Yoshiaki; and Nakazawa, Terutada, 4,257,531, Cl. 221-227.000.
Naley, Lowell B.: *See*—
Christiansen, David A.; Kiefer, Kevin W.; Naley, Lowell B.; Seipp, Ronald W.; Shirek, Lawrence J.; and Harrington, Robert L., 4,257,240, Cl. 62-448.000.
Namura, Koji; and Futakawa, Akemi, to Mitsubishi Denki Kabushiki Kaisha. Discharge valve apparatus of compressor. 4,257,457, Cl. 137-851.000.
Narumiya, Tsuneaki, to Bridgestone Tire Company Limited. Cordierite, silica, alumina porous ceramic body. 4,257,810, Cl. 106-41.000.
Narumiya, Tsuneaki, to Bridgestone Tire Company Limited. Cordierite, alumina, silica porous ceramic bodies coated with an activated alumina layer. 4,258,099, Cl. 428-311.000.
Nash Engineering Company, The: *See*—
Goldman, Steven A., 4,257,747, Cl. 417-63.000.
Nash, Terrence G.: *See*—
Ives, Frank E.; and Nash, Terrence G., 4,257,748, Cl. 417-63.000.
Nassir, Nicholas. Power recovery hot gas separator. 4,257,788, Cl. 55-346.000.
National Manufacturing Company Inc.: *See*—
Stahl, William, 4,257,293, Cl. 83-193.000.
National Research Development Corporation: *See*—
de Brie Perry, Forbes G., 4,257,495, Cl. 188-1.00B.
Hurle, Donald T. J.; and Joyce, Gordon C., 4,258,003, Cl. 422-109.000.
Scales, John T.; and Wright, Keith W. J., 4,257,128, Cl. 3-1.911.
National Semiconductor Corporation: *See*—
Harris, James M., 4,258,382, Cl. 357-71.000.
Huang, Jen-Yen, 4,258,272, Cl. 307-475.000.
National Steel Corporation: *See*—
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Naughton, Warren: *See*—
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NDM Corporation: *See*—
Cartmell, James V., 4,257,424, Cl. 128-641.000.
Neale, Dory J., Jr. Radio geophysical surveying method and apparatus. 4,258,321, Cl. 324-334.000.
Nedelec, Lucien; Torelli, Vesperto; Fournex, Robert; and Tournemine, Colette, to Roussel Uclaf. Novel 7-alkyl-steroids. 4,258,039, Cl. 424-241.000.
Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek: *See*—
Arkenbout, Gerardus J., 4,257,796, Cl. 62-538.000.
Nedwick, Zygmund. Golf swing guides. 4,257,607, Cl. 273-183.00B.
Neel, Robert M., to Teledyne Industries, Inc. Thermostat assembly. 4,257,555, Cl. 236-94.000.
Neff, James A., to MAC Valves, Inc. Valve with internal accumulator and check valve. 4,257,572, Cl. 251-30.000.
Negi, Virendra S.; and Peters, Arthur, to Honeywell Information Systems Inc. Control file apparatus for a data processing system. 4,258,420, Cl. 364-200.000.
Neiman, S.A.: *See*—
Lipschutz, Paul, 4,258,352, Cl. 340-53.000.
Nelsen, M. Dean: *See*—
Diepenbrock, James L., Jr.; Nelsen, M. Dean; and Harp, Marlyn F., 4,257,998, Cl. 264-156.000.
New England Machinery, Inc.: *See*—
Ionescu, Alexandru D., 4,257,516, Cl. 198-399.000.
New York Institute of Technology: *See*—
Glenn, William E., 4,257,271, Cl. 73-626.000.
Newall, Christopher E.: *See*—
O'Callaghan, Cynthia H.; Livermore, David G. H.; and Newall, Christopher E., 4,258,041, Cl. 424-246.000.
Newhouse, Thomas J.: *See*—
Propst, Robert L.; Wodka, Michael A.; and Newhouse, Thomas J., 4,257,203, Cl. 52-221.000.
Newton, T. Lawrence, to Sunburst Solar Energy Corp. Heat exchanger and drain down for solar collector. 4,257,479, Cl. 165-156.000.
Ng, Quock Y.: *See*—
Pittman, Charles U., Jr.; and Ng, Quock Y., 4,258,206, Cl. 560-233.000.
Nicholas, David M.: *See*—
Krichten, David J.; and Nicholas, David M., 4,257,897, Cl. 210-605.000.
Nicolaou, Kyriacos C.; Barnette, William E.; Magolda, Ronald L.; and Lysenko, Zenon, to Research Corporation. Method for preparing cyclic ethers and thioethers including oxygen isomers and sulfur analogs of prostacyclin. 4,258,199, Cl. 549-51.000.
Nidbella, Peter. Circular saw with visual cut line indicator. 4,257,297, Cl. 83-471.300.
Niebur, Mark J. Beehive. 4,257,134, Cl. 6-1.000.
Nihon Kogyo Kabushiki Kaisha: *See*—
Murakami, Tadashi; Yamane, Mamoru; Tokairin, Toshio; and Kawai, Kenji, 4,257,778, Cl. 44-1.00R.
Nihon Kohden Kogyo Co., Ltd.: *See*—
Hagiwara, Seisaku; and Matsuura, Fumio, 4,258,369, Cl. 346-62.000.
Niida, Taro: *See*—
Kai, Fumio; Tsuruoka, Takashi; Makabe, Osamu; Inouye, Shigeharu; Ikeda, Hitoshi; Kazuno, Yuzo; Nakajima, Shokichi; Seki, Shigeo; and Niida, Taro, 4,258,184, Cl. 544-27.000.
Niikura, Masakazu: *See*—
Morris, John W., Jr.; and Niikura, Masakazu, 4,257,808, Cl. 75-123.00N.
Niiro, Yasuhiko: *See*—
Nakagome, Yukio; Niiro, Yasuhiko; Wakabayashi, Hiroharu; and Nunokawa, Makoto, 4,257,675, Cl. 350-96.230.
Nijhawan, Pramodh; and Duckworth, Joseph M., to Envirotech Corporation. Coke guide fumes control system. 4,257,849, Cl. 202-228.000.
Nilsen, David: *See*—
Siemens, Richard E.; Nilsen, David; and Rhoads, Stanley C., 4,258,016, Cl. 423-24.000.
Nimura, Takayasu: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,258,307, Cl. 322-28.000.
Nippon Electric Co., Ltd.: *See*—
Kageyama, Takao, 4,258,286, Cl. 315-3.600.
Ryu, Toshihiko, 4,258,340, Cl. 333-18.000.
Tokuda, Kazuo; Watanabe, Hidetaro; and Shimizu, Yoshikazu, 4,258,311, Cl. 323-313.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Nagai, Yohei; and Okamoto, Shimaji, 4,257,303, Cl. 84-1.220.
Nippon Kogaku K.K.: *See*—
Ohyama, Isao, 4,257,286, Cl. 74-422.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Shimada, Katsuhiko; Komine, Isamu; Tanabe, Hideya; Tsunozaki, Shuichi; Yamada, Masayoshi; and Takahashi, Tsuguo, 4,258,319, Cl. 324-226.000.
Nippon Paint Co., Ltd.: *See*—
Wada, Hideo; Ushio, Akiro; and Koganei, Masaharu, 4,257,828, Cl. 148-6.160.
Nippon Soken, Inc.: *See*—
Matsui, Takeshi; Kohama, Tokio; Kawai, Hisasi; Nishimatsu, Akira; Ina, Toshikazu; Nohira, Hidetaka; and Kobashi, Kiyoshi, 4,257,382, Cl. 123-571.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Yamazaki, Yasuhiro; Wakahara, Yasushi; Yuuki, Kiyohiro; and Yamada, Toyomichi, 4,258,392, Cl. 358-260.000.
Nippondenso Co., Ltd.: *See*—
Kinugawa, Masumi; and Yamazoe, Hisamitsu, 4,257,377, Cl. 123-492.000.
Kondo, Takashi; Tagawa, Yasuo; Mizuno, Kiyohiko; and Tsuboi, Nobutoshi, 4,257,458, Cl. 137-855.000.
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,258,307, Cl. 322-28.000.
Nishide, Katsuhiko: *See*—
Matsumoto, Masakazu; and Nishide, Katsuhiko, 4,258,111, Cl. 430-2.000.
Nishihara, Motohisa: *See*—
Shimada, Satoshi; Kawakami, Kanji; and Nishihara, Motohisa, 4,257,274, Cl. 73-718.000.
Nishikawa, Kyoichi, to TDK Electronics Co., Ltd. Humidifier. 4,257,989, Cl. 261-4.000.
Nishikawa, Masaji: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,257,700, Cl. 355-3.0TR.
Nishimatsu, Akira: *See*—
Matsui, Takeshi; Kohama, Tokio; Kawai, Hisasi; Nishimatsu, Akira; Ina, Toshikazu; Nohira, Hidetaka; and Kobashi, Kiyoshi, 4,257,382, Cl. 123-571.000.
Nishimi, Ichiro, to Kabushiki Kaisha Saginomiya Seisakusho. Small-sized power relay. 4,258,344, Cl. 335-129.000.

Nishimura, Nobuzi; Tsuji, Masayuki; Konishi, Seizo; Yamamoto, Tadashi; Tokieda, Takemi; Sawa, Utazi; and Koumura, Suketsugu, to Sumitomo Chemical Company, Limited. Disazo dye composition. 4,257,770, Cl. 8-549.000.

Nishimura, Takanori: *See*—
Watanabe, Tomoyuki; Okabe, Takahiro; Nagata, Minoru; Nakamura, Tohru; Kaneko, Kenji; Okada, Yutaka; Anzai, Norio; Nishimura, Takanori; and Agatsuma, Takashi, 4,258,379, Cl. 357-44.000.

Nishiyama, Mitsuru, to Sharp Kabushiki Kaisha. Electrochromic segments formed on a display electrode in an electrochromic display cell. 4,257,684, Cl. 350-357.000.

Nissan Chemical Industries, Ltd.: *See*—
Tsubaki, Kazumi; Koto, Noriaki; and Maeda, Kouichi, 4,258,167, Cl. 526-128.000.

Nissan Motor Company, Limited: *See*—
Abe, Eiichi; Ogawa, Naoki; Kubozuka, Takao; and Takei, Hirofumi, 4,257,369, Cl. 123-198.00E.
Etoh, Yukihiro; Tanaka, Toshiaki; and Kunii, Kazuya, 4,257,372, Cl. 123-198.00F.
Fujii, Toshihiko, 4,257,840, Cl. 156-556.000.
Hiraiwa, Kazuyoshi; and Takahashi, Kotei, 4,257,509, Cl. 192-86.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,257,441, Cl. 137-116.300.
Kita, Toru; Kobayashi, Hiroshi; and Fujishiro, Takeshi, 4,257,276, Cl. 73-861.220.
Watanabe, Kiyoto; and Otani, Syuichi, 4,258,350, Cl. 337-198.000.
Yuzawa, Haruo; and Yano, Tsuneomi, 4,257,381, Cl. 123-571.000.

Nittan Company, Limited: *See*—
Tagashira, Hiroshi, 4,258,360, Cl. 340-630.000.

Niwa, Yukichi: *See*—
Hosoe, Kazuya; Niwa, Yukichi; Tsunekawa, Tokuichi; Owada, Mitsutoshi; Asano, Noriyuki; and Masunaga, Makoto, 4,257,705, Cl. 356-1.000.

Noack, Dieter; and Oltersdorf, Winfried, to Siemens Aktiengesellschaft. Electric circuit breaker. 4,258,239, Cl. 200-148.00A.

Nodov, Eugene, to Mead Corporation, The. Document scanning system. 4,258,395, Cl. 358-293.000.

Nogami, Tomoyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Anti-rust cover for a disc rotor of a vehicle disc brake. 4,257,498, Cl. 188-218.00A.

Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Two-stroke cycle diesel engine. 4,257,365, Cl. 123-51.00B.

Nohira, Hidetaka: *See*—
Matsui, Takeshi; Kohama, Tokio; Kawai, Hisasi; Nishimatsu, Akira; Ina, Toshikazu; Nohira, Hidetaka; and Kobashi, Kiyoshi, 4,257,382, Cl. 123-571.000.

Noren, Tore H. Removable and self sealing spray manifold for commercial dishwasher. 4,257,559, Cl. 239-283.000.

North Bend Fabrication & Machine, Inc.: *See*—
Beaver, Robert, 4,257,731, Cl. 414-694.000.

Norton, Richard C.: *See*—
Johnson, William B.; and Norton, Richard C., 4,257,171, Cl. 34-57.00A.

Novichkov, Alexandr N.: *See*—
Shirokov, Vasily I.; Maljutin, Gennady G.; Mishiev, Ilyasaf I.; Koshkin, Nikolai N.; Abdullaeva, Farida S.; Stukalenko, Anatoly K.; Novichkov, Alexandr N.; and Saveliev, Jury V., 4,257,794, Cl. 62-28.000.

Noyori, Kazumasa: *See*—
Nagashima, Yoshitake; Noyori, Kazumasa; and Moriyama, Hideki, 4,258,274, Cl. 307-254.000.

Nunn, Terence M.: *See*—
Beatson, Michael F. F.; and Nunn, Terence M., 4,257,260, Cl. 73-119.00A.

Nunokawa, Makoto: *See*—
Nakagome, Yukio; Niiro, Yasuhiko; Wakabayashi, Hiroharu; and Nunokawa, Makoto, 4,257,675, Cl. 350-96.230.

Nusslein, Ludwig: *See*—
Arndt, Friedrich; and Nusslein, Ludwig, 4,257,804, Cl. 71-106.000.

Nutz, Karl-Diether, to Licentia Patent-Verwaltungs-G.m.b.H. Discriminator circuits. 4,258,277, Cl. 307-350.000.

O.M.M. Officine Meccaniche Menegatto S.p.A.: *See*—
Menegatto, Carlo, 4,257,220, Cl. 57-89.000.

O. Mustad & Son A/S: *See*—
Etnestad, Hermann; and Laugerud, Sverre, 4,257,336, Cl. 110-245.000.

Obara, Hiroshi; and Kon, Tetuaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Infrared detector. 4,258,259, Cl. 250-338.000.

Obara, Hiroshi; Kon, Tetuaki; and Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pyroelectric infrared detector. 4,258,260, Cl. 250-338.000.

Obermayer, Arthur S. Toxic-monitoring badge and method of use. 4,258,000, Cl. 422-55.000.

O'Brien, Anne: *See*—
Whittaker, Graham; and O'Brien, Anne, 4,257,857, Cl. 204-158.0HA.

O'Callaghan, Cynthia H.; Livermore, David G. H.; and Newall, Christopher E., to Glaxo Group Limited. (6R,7R)-7-[(Z)-2-(2-Aminothiazol-4-yl)-2-(2-carboxyprop-2-oxyimino)acetamido]-3-(1-pyridiniummethyl)-ceph-3-em-4-carboxylate and salts thereof. 4,258,041, Cl. 424-246.000.

Occidental Chemical Company: *See*—
Gragg, F. Michael; and Adams, Allen S., 4,258,007, Cl. 422-189.000.
Gragg, Fredrick M.; Ellis, John D.; and Adams, Allen S., 4,258,008, Cl. 422-189.000.

Occidental Research Corporation: *See*—
Gragg, F. Michael; and Adams, Allen S., 4,258,007, Cl. 422-189.000.
Gragg, Fredrick M.; Ellis, John D.; and Adams, Allen S., 4,258,008, Cl. 422-189.000.

Oellerer, Friedrich: *See*—
Theurer, Josef; and Oellerer, Friedrich, 4,257,331, Cl. 104-2.000.

Oeser, Heinz-Guenter: *See*—
Koenig, Karl-Heinz; Oeser, Heinz-Guenter; and Feuerherd, Karl-Heinz, 4,257,974, Cl. 260-453.00A.

Oestreich, Ulrich: *See*—
Liertz, Heinrich; Oestreich, Ulrich; and Zeidler, Guenter, 4,257,707, Cl. 356-73.100.

Ogata, Hisao; and Fujii, Michinobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Device for interconnecting turbine blades. 4,257,742, Cl. 416-190.000.

Ogawa, Masaki; Araki, Tamio; and Yamamoto, Shinji, to Bridgestone Tire Company Limited; and Ube Industries Limited. Pneumatic tire having an improved chipping resistant property employing syndiotactic-1,2-polybutadiene in tread rubber. 4,257,468, Cl. 152-209.00R.

Ogawa, Naoki: *See*—
Abe, Eiichi; Ogawa, Naoki; Kubozuka, Takao; and Takei, Hirofumi, 4,257,369, Cl. 123-198.00E.

Ogle, Francis H., Jr.; and Koppl, Ernest R., to Transamerica DeLaval Inc. Insert check valve or the like. 4,257,444, Cl. 137-315.000.

Ogura, Toshiyuki: *See*—
Yoshida, Tetsuo; Ogura, Toshiyuki; Tajiri, Shinji; and Sata, Toshio, 4,257,317, Cl. 93-40.000.

Ogura, Tsutomu: *See*—
Matsuyama, Kiyoshi; Ishikawa, Shozi; Hirata, Seizi; and Ogura, Tsutomu, 4,257,533, Cl. 222-1.000.

Ohkubo, Kazuo: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,258,192, Cl. 546-166.000.

Ohmi, Atsushi; and Furuta, Yoichi, to Aisin Seiki Kabushiki Kaisha. Tandem diaphragm brake booster. 4,257,312, Cl. 91-369.00A.

Ohmura, Tadayoshi: *See*—
Kawata, Hiroitsu; Ohmura, Tadayoshi; Shiozawa, Hiroyoshi; and Hattori, Munetaka, 4,258,179, Cl. 536-95.000.

Ohsaka, Yukio; and Ikeda, Takaharu, to Sony Corporation. Switching type power supply circuit. 4,258,309, Cl. 323-287.000.

Ohtsuka, Kunio: *See*—
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,257,441, Cl. 137-116.300.

Ohyama, Isao, to Nippon Kogaku K.K. Precision driving apparatus. 4,257,286, Cl. 74-422.000.

Ohyodo Kinzoku Kogyo: *See*—
Takegoshi, Katsuki; and Ono, Kiyomi, 4,257,144, Cl. 17-30.000.

Ohzeki, Toshio; Akutsu, Mitsuo; and Kawai, Junji, to Argus Chemical Corp. Clarified olefin polymer composition. 4,258,142, Cl. 525-2.000.

Oka, Takashi; and Morimoto, Hiroshi, to Sharp Kabushiki Kaisha. Item list setting mechanism in an item selection signal input system. 4,257,179, Cl. 40-378.000.

Okabe, Takahiro: *See*—
Kaneko, Kenji; Okabe, Takahiro; Nakamura, Tohru; Takasugi, Wasao; and Nagata, Minoru, 4,258,330, Cl. 330-257.000.
Watanabe, Tomoyuki; Okabe, Takahiro; Nagata, Minoru; Nakamura, Tohru; Kaneko, Kenji; Okada, Yutaka; Anzai, Norio; Nishimura, Takanori; and Agatsuma, Takashi, 4,258,379, Cl. 357-44.000.

Okada, Yutaka: *See*—
Watanabe, Tomoyuki; Okabe, Takahiro; Nagata, Minoru; Nakamura, Tohru; Kaneko, Kenji; Okada, Yutaka; Anzai, Norio; Nishimura, Takanori; and Agatsuma, Takashi, 4,258,379, Cl. 357-44.000.

Okamoto, Shimaji: *See*—
Nagai, Yohei; and Okamoto, Shimaji, 4,257,303, Cl. 84-1.220.

Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-Arylsulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,258,192, Cl. 546-166.000.

Okamura, Masahiro: *See*—
Miyata, Kenji; Kamei, Tatsuya; and Okamura, Masahiro, 4,258,377, Cl. 357-38.000.

Okawa, Kaneyas, to Olympus Optical Co., Ltd. Reproducing objective for video disks. 4,257,679, Cl. 350-469.000.

O'Keefe, Dennis R.; and Williamson, David G., to General Atomic Company. Hydrogen iodide decomposition. 4,258,026, Cl. 423-648.00R.

Okland, Merlyn C. Running board and method for assembling same. 4,257,620, Cl. 280-153.00R.

Okumura, Michitoshi: *See*—
Yoshimoto, Hiromu; Okumura, Michitoshi; and Kawate, Kenji, 4,257,829, Cl. 148-13.000.

Olechowski, Jerome R.: *See*—
Levine, Ralph; and Olechowski, Jerome R., 4,258,223, Cl. 568-899.000.

Olender, Kornel: *See*—
Sedlaczek, Janusz; Krutki, Marian; and Olender, Kornel, 4,257,649, Cl. 299-43.000.
Olin Corporation: *See*—
Chandalia, Kiran B.; and Preston, Frank J., 4,258,148, Cl. 525-168.000.
Kadija, Igor V., 4,258,081, Cl. 427-121.000.
Oller, Jaime M. Tool fastening system for woodworking machines or the like. 4,257,462, Cl. 144-218.000.
Ollivier, Louis A., to Veriflo Corporation. Pressure-reducing regulator valve for high-pressure gases. 4,257,450, Cl. 137-505.420.
Oltersdorf, Winfried: *See*—
Noack, Dieter; and Oltersdorf, Winfried, 4,258,239, Cl. 200-148.00A.
Olympic Infra-Dry Inc.: *See*—
Townsend, Newton A., 4,257,172, Cl. 34-68.000.
Olympus Optical Co., Ltd.: *See*—
Arima, Heihachi; and Shinohara, Toshio, 4,257,868, Cl. 204-299.00R.
Nakajima, Yukio, 4,258,290, Cl. 315-135.000.
Nakajima, Yukio, 4,258,297, Cl. 315-241.00P.
Okawa, Kaneyas, 4,257,679, Cl. 350-469.000.
Sato, Masaaki, 4,258,402, Cl. 360-137.000.
Terayama, Toshiki, 4,257,420, Cl. 128-303.00A.
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,257,700, Cl. 355-3.0TR.
Yamasaki, Masafumi, 4,258,294, Cl. 315-151.000.
Yoshida, Masahide; and Kodama, Takashi, 4,258,401, Cl. 360-125.000.
O'Mahoney, Joseph F., Jr., to Goodyear Tire & Rubber Company, The. Flexural modulus paintable rubber composition. 4,257,934, Cl. 260-27.0BB.
Omnewtronics, Inc.: *See*—
Strem, Robert C.; Strem, Richie C.; and Eberle, John H., 4,257,366, Cl. 123-554.000.
One Design, Inc.: *See*—
Maloney, Timothy, 4,257,477, Cl. 165-48.00S.
Ono, Kiyomi: *See*—
Takegoshi, Katsuki; and Ono, Kiyomi, 4,257,144, Cl. 17-30.000.
Ono, Masamichi; Eto, Akira; and Yagi, Hideji, to Kabushiki Kaisha Ono Sokki Seisakusho. Method and apparatus for controlling load of dynamometer. 4,257,261, Cl. 73-134.000.
Onoda, Mamoru: *See*—
Fujita, Isao; Onoda, Mamoru; Kawaguchi, Fumikazu; Takenaka, Yoshimichi; and Tsutaya, Tadao, 4,257,806, Cl. 75-3.000.
Onoye, Hideo: *See*—
Kitamura, Masatsugu; Onoye, Hideo; and Yamazaki, Masami, 4,258,397, Cl. 360-31.000.
Oomen, Johannes M.: *See*—
Daenen, Theo E. G.; Oomen, Johannes M.; and Van de Berg, Joseph F. M., 4,257,854, Cl. 204-36.000.
Ooyama, Naotake: *See*—
Shigeta, Kiyoko; Matsumoto, Shuntetsu; Ooyama, Naotake; and Imai, Takashi, 4,258,351, Cl. 340-38.00P.
Optical Warehouse Showroom and Manufacturing, Inc.: *See*—
Matos, R. Jay; Matos, Eliseo J.; and Blaik, Robert, 4,257,988, Cl. 264-1.100.
Opto Produkte AG: *See*—
Rottenkolber, Hans, 4,257,264, Cl. 73-146.000.
Oriental Yeast Co. Ltd.: *See*—
Takagahara, Isamu; Yamauti, Juniti; Yoshimura, Setsuko; Fujii, Katsumi; and Horio, Takekazu, 4,258,131, Cl. 435-26.000.
Orion Industries, Inc.: *See*—
Valenzona, Joseph F.; and Fenstermaker, Michael, 4,258,004, Cl. 422-123.000.
Ornberg, Stellan. Anchoring device for an opening, e.g. a tube end. 4,257,308, Cl. 411-354.000.
Ornstein, Leonard; Williams, Hazel E.; and Intraub, Julius, to Technicon Instruments Corp. Apparatus for mounting tissue sections with an U.V. light curable mounting medium. 4,257,346, Cl. 118-641.000.
Orth, Dieter: *See*—
Gante, Joachim; Radunz, Hans-Eckart; Orth, Dieter; Minck, Klaus; Wild, Albrecht; and Klockow, Michael, 4,258,047, Cl. 424-250.000.
Orvik, Jon A., to Dow Chemical Company, The. Method for removing chloropicrin from an aqueous medium. 4,257,899, Cl. 210-758.000.
Oshima, Akinobu: *See*—
Shimizu, Shigeki; and Oshima, Akinobu, 4,258,124, Cl. 430-285.000.
Ostgaard, John T., to Pipe Technology Systems, Inc. Apparatus and method for driving members into the ocean floor. 4,257,720, Cl. 405-227.000.
Ostrander, Kenneth: *See*—
Soehngen, John W.; and Ostrander, Kenneth, 4,257,997, Cl. 264-145.000.
Otani, Kozaburo: *See*—
Fujimori, Shigeo; Saito, Tohru; Otani, Kozaburo; and Nagatani, Taizi, 4,258,242, Cl. 219-61.000.
Otani, Syuichi: *See*—
Watanabe, Kiyoto; and Otani, Syuichi, 4,258,350, Cl. 337-198.000.
Otto Dur Anlagenbau GmbH: *See*—
Gutjahr, Rolf; and Bhatnagar, Satpal, 4,257,783, Cl. 55-61.000.
Outlaw, Homer G. Abdominal exercise device. 4,257,589, Cl. 272-93.000.
Overman, Kelly C.: *See*—
Brown, Joel E.; and Overman, Kelly C., 4,258,362, Cl. 343-7.300.
Owada, Mitsutoshi: *See*—
Hosoe, Kazuya; Niwa, Yukichi; Tsunekawa, Tokuichi; Owada, Mitsutoshi; Asano, Noriyuki; and Masunaga, Makoto, 4,257,705, Cl. 356-1.000.
Owens-Corning Fiberglas Corporation: *See*—
Cottrell, Walter D., Jr.; and Jutte, Ralph B., Jr., 4,258,106, Cl. 428-482.000.
Owens-Illinois, Inc.: *See*—
Amberg, Christopher P., 4,257,532, Cl. 221-240.000.
Hasegawa, Katsundo, 4,257,800, Cl. 65-221.000.
Uhlig, Albert R., 4,257,537, Cl. 222-153.000.
Oy Nokia AB: *See*—
Kirjavainen, Kari J., 4,257,991, Cl. 264-40.600.
Ozawa, Hitoshi: *See*—
Hosoi, Kazuo; and Ozawa, Hitoshi, 4,257,938, Cl. 260-112.00R.
Pace, Marshall O.: *See*—
Christophorou, Loucas G.; James, David R.; Pace, Marshall O.; and Pai, Robert Y., 4,257,905, Cl. 252-571.000.
Pahlsson, Nils-Erik: *See*—
Wangeby, Percy; and Pahlsson, Nils-Erik, 4,257,461, Cl. 144-2.00Z.
Pai, Robert Y.: *See*—
Christophorou, Loucas G.; James, David R.; Pace, Marshall O.; and Pai, Robert Y., 4,257,905, Cl. 252-571.000.
Paivanas, John A.: *See*—
Hassan, Javathu K.; and Paivanas, John A., 4,257,637, Cl. 294-64.00B.
Palka, Agnes M.: *See*—
Allen, John K.; Palka, Agnes M.; and Lambers, Edward A., 4,258,227, Cl. 585-469.000.
Pamplin, James B. Apparatus and method for crushing material. 4,257,564, Cl. 241-30.000.
Panhandle Eastern Pipe Line Company: *See*—
Andrews, Larry A.; and Tietze, Thomas N., 4,258,323, Cl. 324-348.000.
Panke, Hans L.: *See*—
Kleber, Rolf; Panke, Hans L.; and Hoffmann, Erich, 4,257,769, Cl. 8-188.000.
Panken, Irving; Radow, Robert S.; and Briddell, Brian J., to Mazer Corporation, The. Fluidless masters. 4,257,329, Cl. 101-473.000.
Papadofrangakis, Emmanuel; and Fakiris, John A., to General Electric Company. Quantitative volume blood flow measurement by an ultrasound imaging system featuring a Doppler modality. 4,257,278, Cl. 73-861.250.
Papay, Joseph M., to Pay Television Corporation. Sound intercarrier detector. 4,258,391, Cl. 358-197.000.
Papeschi, Roberto: *See*—
Balzarini, Giovanni; and Papeschi, Roberto, 4,258,426, Cl. 364-518.000.
Paranay, Bruce J.; and Michael, Melvin D. Water gun. 4,257,460, Cl. 141-26.000.
Paranjpe, Suresh C., to Mead Corporation, The. Jet drop printer. 4,258,370, Cl. 346-75.000.
Pardon, John T. Chain saw guard. 4,257,162, Cl. 30-161.000.
Park-Ohio Industries, Inc.: *See*—
Soworowski, David R., 4,258,241, Cl. 219-10.710.
Parrini, Paolo: *See*—
Ciaccia, Vittorio; and Parrini, Paolo, 4,257,842, Cl. 162-117.000.
Parsons, Frederick L., to Bohr Scientific Corporation. Dispenser unit with lockable actuating lever. 4,257,267, Cl. 73-425.600.
Parsons, Jack L.: *See*—
Dubicki, Henryk; Parsons, Jack L.; and Starks, Fred W., 4,258,191, Cl. 546-106.000.
Partin, Hazel R. R.: *See*—
Vachon, Raymond N.; and Partin, Hazel R. R., 4,257,928, Cl. 260-33.40R.
Partin, James R.; Bose, James E.; and Ledbetter, Carl W. Earth coil heating and cooling system. 4,257,239, Cl. 62-238.700.
Partin, Robert M.: *See*—
Prather, Richard A.; Williams, David L.; Partin, Robert M.; and Rabourn, Warren J., 4,258,169, Cl. 528-72.000.
Patel, Jayantilal S., to Eubanks Engineering Co. Multiple purpose cutter apparatus. 4,257,295, Cl. 83-374.000.
Paton, Bruce L., to Centuri Engineering Co. Inc. Fin assembly system for model rockets. 4,257,152, Cl. 29-281.400.
Paton, George, to Twinfold Nominees Pty. Limited. Check valve. 4,257,451, Cl. 137-512.100.
Pauls, Mathias: *See*—
Horacek, Heinrich; Gehm, Robert; Volkert, Otto; Chakrabarti, Sarbananda; Pauls, Mathias; and Weyland, Peter, 4,258,140, Cl. 521-114.000.
Pavan, Charles; and Bulidon, Jacques, to Roussel Uclaf. Resolution process using L or D N-methyl-ephedrine. 4,257,976, Cl. 260-501.170.
Pay Television Corporation: *See*—
Papay, Joseph M., 4,258,391, Cl. 358-197.000.
Payne, John M. Taking of finger prints. 4,258,073, Cl. 427-1.000.
Pearce, Ronald A.: *See*—
Weits, Ferdinand; Pearce, Ronald A.; and Pennington, Norman G., 4,257,526, Cl. 215-332.000.
Pearson, William B., to Imperial Chemical Industries Limited. Liquid flow control. 4,257,437, Cl. 137-8.000.
Peil, William, to General Electric Company. Pulse generator producing short duration high current pulses for application to a low impedance load. 4,258,338, Cl. 331-111.000.
Pellenen, Anatoly P.: *See*—
Vydrin, Vladimir N.; Ageev, Leonid M.; and Pellenen, Anatoly P., 4,257,252, Cl. 72-232.000.

Penn Corporation: *See*—
Sherman, Alan E.; and Koeln, Harold E., 4,257,713, Cl. 401-88.000.

Pennington, Norman G.: *See*—
Weits, Ferdinand; Pearce, Ronald A.; and Pennington, Norman G., 4,257,526, Cl. 215-332.000.

Pennwalt Corporation: *See*—
McKellin, Wilbur H., 4,257,985, Cl. 568-308.000.
Toukan, Sameeh S., 4,258,197, Cl. 548-167.000.

Pennybaker, Richard W. Bowling arm training device. 4,257,597, Cl. 273-54.00B.

Penzel, Erich: *See*—
Fischer, Martin; Kuesters, Werner; Penzel, Erich; Rehder, Wolfgang; and Trautmann, Walter, 4,257,859, Cl. 204-159.230.

Pepicelli, Pasquale L.; and Mavilia, Robert A., to Data Packaging Corporation. Pipetter. 4,257,268, Cl. 73-425.600.

Permabond International Corporation: *See*—
Vachon, Raymond N.; and Partin, Hazel R. R., 4,257,928, Cl. 260-33.40R.

Persbeck, Sven E., to Gotaverken Arendal AB. Supporting structure. 4,257,585, Cl. 269-133.000.

Peters, Arthur: *See*—
Negi, Virendra S.; and Peters, Arthur, 4,258,420, Cl. 364-200.000.

Petersen, Robert E. Pipe connector and hole cutter. 4,257,628, Cl. 285-3.000.

Peterson, Marvin L., to Du Pont de Nemours, E. I., and Company. Preparation of furan compounds. 4,257,960, Cl. 260-346.110.

Petticrew, Dennis E.: *See*—
Fishback, J. William; and Petticrew, Dennis E., 4,257,878, Cl. 209-2.000.

Peyton, John J., to Industrial Automation Corp. Full depth uncaser. 4,257,727, Cl. 414-416.000.

Pfeifer, Josef; and Reinehr, Dieter, to Ciba-Geigy Corporation. Transparent copolyamide from 1,10-disubstituted C_{11} diamine. 4,258,176, Cl. 528-338.000.

Pfeifer, Josef, to Ciba-Geigy Corporation. Transparent copolyamide from 1,10-disubstituted C_{10} diamine. 4,258,177, Cl. 528-338.000.

Pfeiffer, Erich, to BASF Aktiengesellschaft. Manufacture of ethylene homopolymers and copolymers. 4,258,158, Cl. 526-68.000.

Pfeiffer, Horst, to J. Hengstler K. G. Electrically operated device for marking metal-coated paper. 4,258,374, Cl. 346-163.000.

Pfizer Inc.: *See*—
Cronin, Timothy H.; Faubl, Hermann; Hoffman, William W.; and Korst, James J., 4,258,061, Cl. 424-325.000.
Mathur, Krishna K.; and Rush, Olinda W., 4,257,817, Cl. 106-266.000.
Sarges, Reinhard, 4,258,054, Cl. 424-273.00R.

Phillips Petroleum Company: *See*—
Bjornson, Geir, 4,258,268, Cl. 568-350.000.
Brackmann, Richard T., 4,258,257, Cl. 250-281.000.
Childers, Clifford W.; and Uber, Raymond F., 4,258,144, Cl. 525-91.000.
Cobb, Raymond L., 4,258,150, Cl. 525-316.000.
Favre, John A.; and Schmidt, Thomas W., 4,258,427, Cl. 364-527.000.
Ford, Gregory A., 4,257,259, Cl. 73-61.10C.
Knudsen, Ronald D.; and Bjornson, Geir, 4,258,221, Cl. 568-806.000.
McKay, Dwight L., 4,257,876, Cl. 208-120.000.
Roberts, John S.; McKay, Dwight L.; Bertus, Brent J.; and Mark, H. Wayne, 4,257,919, Cl. 252-461.000.
Uraneck, Carl A.; and Burleigh, John E., 4,258,162, Cl. 526-173.000.
Williams, Ralph P., 4,258,105, Cl. 428-431.000.
Wright, Roy F., 4,258,145, Cl. 525-99.000.
Wu, Yulin, 4,257,966, Cl. 260-348.160.

Piccardi, Paolo; Corda, Francesco; Gozzo, Franco; and Menconi, Augusto, to Montedison S.p.A. Cyclopropanecarboxylic acids and esters. 4,258,202, Cl. 560-124.000.

Piccirillo, Thomas P.: *See*—
Dalamangas, Chris A.; and Piccirillo, Thomas P., 4,257,661, Cl. 339-75.0MP.

Pichler, Gunther: *See*—
Rothhaas, Friedrich; and Pichler, Gunther, 4,257,656, Cl. 312-214.000.

Pierce, Bill L., to Westinghouse Electric Corp. Bi-brayton power generation with a gas-cooled nuclear reactor. 4,257,846, Cl. 176-60.000.

Pierce, Jack. Commodity dryer. 4,257,169, Cl. 34-27.000.

Pierce, Zona R.; and Frank, David S., to Eastman Kodak Company. Element, structure and method for the analysis or transport of liquids. 4,258,001, Cl. 422-56.000.

Piesch, Steffen: *See*—
Bender, Heinz; Beyerle, Rudi; Piesch, Steffen; and Martorana, Piero A., 4,258,043, Cl. 424-250.000.

Pilgram, Kurt H., to Shell Oil Company. Herbicidal (4-substituted-phenylamino)-3-(trifluoromethyl)phenyl)ureas. 4,257,805, Cl. 71-120.000.

Pilz, Erich: *See*—
Schmidt, Herbert; Kurz, Erwin; Berger, Rudolf; and Pilz, Erich, 4,257,728, Cl. 414-468.000.

Pinkasovich, Juliana: *See*—
Hanson, James M.; Pinkasovich, Juliana; and Sterling, Vaughn C., 4,258,412, Cl. 362-10.000.

Pioneer Electronic Corporation: *See*—
Nakayama, Kazuaki, 4,258,331, Cl. 330-261.000.
Tokumo, Akio, 4,258,329, Cl. 330-149.000.

Pipe Technology Systems, Inc.: *See*—
Ostgaard, John T., 4,257,720, Cl. 405-227.000.

Pisarevskij, Jurij V.: *See*—
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,257,685, Cl. 350-358.000.

Pittman, Charles U., Jr.; and Ng, Quock Y., to University of Alabama, The. Selective carbonylation of olefins by a polymer-supported Pd halide catalyst. 4,258,206, Cl. 560-233.000.

Pittway Corporation: *See*—
Conforti, Frederick J., 4,258,261, Cl. 250-381.000.

Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Polycyclic nitrogen-containing compounds. 4,257,941, Cl. 260-152.000.

Platz, Rolf; Kummer, Rudolf; and Schneider, Heinz-Walter, to BASF Aktiengesellschaft. Preparation of butanedicarboxylic acid esters. 4,258,203, Cl. 560-204.000.

Pless, Ernst, to Viennaplex Fabrik fur Kunststofferzeugnisse Ernst Pless KG. Phonograph record cleaning device. 4,257,616, Cl. 15-230.000.

Pless, John H., to Electron Kilns (Luzern) GmbH, of Zahringerhof. Method and apparatus for radio frequency drying of lumber. 4,258,240, Cl. 219-10.410.

Plessey Handel und Investments AG: *See*—
Browell, Leslie J., 4,258,357, Cl. 340-506.000.

Plunkett, Allan B., to General Electric Company. Apparatus for maintaining synchronism of an inverter-synchronous machine drive system at light or zero machine loads. 4,258,302, Cl. 318-723.000.

Plymouth Products Incorporated: *See*—
Sokol, Louis, 4,258,414, Cl. 362-421.000.

Poe, Martin; and Ruyle, William V., to Merck & Co., Inc. Inhibitor of dihydrofolate reductase. 4,258,045, Cl. 424-251.000.

Pogue, James B.: *See*—
Whitley, Oran D.; and Pogue, James B., 4,257,484, Cl. 166-325.000.

Polaroid Corporation: *See*—
Buldini, Daniel A.; and Richard, Donald P., 4,258,263, Cl. 250-480.000.
Cournoyer, Richard L.; and Foley, James W., 4,258,119, Cl. 430-221.000.
Foley, James W.; Locatell, Louis, Jr.; and Zepp, Charles M., 4,258,118, Cl. 430-221.000.

Poler, Stanley. Packaging means for an intraocular lens. 4,257,521, Cl. 206-5.100.

Pollack, Hyman. Shelving structure adapted for quick assembly and adjustment. 4,257,333, Cl. 108-144.000.

Pollock, James F.; Linger, Keith R.; and Hewinson, Vincent K., to United Kingdom Atomic Energy Authority. Porous electrical resistance heaters. 4,257,157, Cl. 29-611.000.

Polysius AG: *See*—
Ritzmann, Horst; Bauer, Klaus; Schmits, Heinz-Herbert; Goldmann, Wolf; and Korn, Hennig, 4,257,766, Cl. 432-14.000.

Pont-A-Mousson S.A.: *See*—
Fort, Pierre H. M., 4,257,474, Cl. 164-299.000.

Popov, Alexandr D.; Solomin, Vladimir A.; and Mindin, Vladimir M. Linear induction motor. 4,258,278, Cl. 310-13.000.

Porter, Donald H., to Estey Dynamics Corporation. Electrogasdynamic coating apparatus. 4,258,409, Cl. 361-227.000.

Porter, William L.; and Kramer, Roslyn E., to United States of America, Army. Method of visually detecting antioxidant in an organic mixture. 4,257,776, Cl. 23-230.00M.

Portes, Pierre J.: *See*—
Hoffer, Jean O.; Guelen, Jean C.; Portes, Pierre J.; and Haller, Jean P., 4,258,024, Cl. 423-474.000.

Potasse et Produits Chimiques: *See*—
Hoffer, Jean O.; Guelen, Jean C.; Portes, Pierre J.; and Haller, Jean P., 4,258,024, Cl. 423-474.000.

Potomac Applied Mechanics, Inc.: *See*—
Stubbings, James H., 4,257,548, Cl. 227-8.000.

Potter, Ralph M.; and Debesis, John R., to General Electric Company. Color corrected flash lamp. 4,257,765, Cl. 431-360.000.

Potters Industries, Inc.: *See*—
Hayden, Robert E., Sr., 4,258,084, Cl. 427-239.000.

Poux, Jacques: *See*—
Belle, Pierre; and Poux, Jacques, 4,257,866, Cl. 204-253.000.

Powell, Justin C., to Texaco Inc. Stabilized acid anhydrides. 4,257,958, Cl. 260-346.700.

Powell, William J., to Stauffer Chemical Company. Processing elemental phosphorus (P_4) containing gas streams. 4,258,018, Cl. 423-210.000.

PPG Industries, Inc.: *See*—
Tsai, Yih-Wan, 4,257,476, Cl. 165-9.300.

Prager, David. Multi-channel venipuncture infusion set. 4,257,416, Cl. 128-214.00R.

Prather, Richard A.; Williams, David L.; Partin, Robert M.; and Rabourn, Warren J., to Upjohn Company, The. Polyisocyanate compositions containing in-situ formed pyrophosphate mold release agent and process of making. 4,258,169, Cl. 528-72.000.

Prazmowski, Bogdan D. E. Vegetable oil extraction apparatus. 4,258,011, Cl. 422-273.000.

Prescon Corporation: *See*—
Presnall, Homer H., Jr.; and Cutler, Earl G., 4,257,491, Cl. 182-142.000.

Presley, Wayman R. Device for teaching counting. 4,257,174, Cl. 434-188.000.

Presnall, Homer H., Jr.; and Cutler, Earl G., to Prescon Corporation. Scaffold apparatus. 4,257,491, Cl. 182-142.000.

Preston, Frank J.: *See—*
Chandalia, Kiran B.; and Preston, Frank J., 4,258,148, Cl. 525-168.000.

Prevot, Julien; and Raux, Jean-Claude, to Societe Lignes Telegraphiques et Telephoniques. Feed forward microwave amplifier for communication systems. 4,258,328, Cl. 330-149.000.

Price, John C., to General Electric Company. Furnace temperature control. 4,257,767, Cl. 432-24.000.

Prohaska, Peter, to Hoechst Aktiengesellschaft. Device measuring the concentration of toner in a developer mixture. 4,257,348, Cl. 118-689.000.

Project Construction Services Ltd.: *See—*
Groothius, William, 4,257,289, Cl. 82-4.00C.

Propst, Robert L.; Wodka, Michael A.; and Newhouse, Thomas J., to Herman Miller, Inc. Under the wall wiring system with improved cover members. 4,257,203, Cl. 52-221.000.

Prudhon, Francois; and Scicluna, Augustin, to Rhone-Poulenc Industries. Process for treating substances in different phases, such as the treatment of substances in liquid, semi-liquid or paste form, by another notably gaseous phase. 4,257,339, Cl. 110-346.000.

Ptaszek, George W.; and Hudson, Robert H. Snapping animal game. 4,257,610, Cl. 273-248.000.

Pullman Incorporated: *See—*
Coccia, Larry A., 4,257,485, Cl. 169-61.000.

Pullman, James O.: *See—*
Collins, Peter F.; Bryant, Herman G., Jr.; and Pullman, James O., 4,257,430, Cl. 131-140.00B.

Pulyaevsky, Georgy G.: *See—*
Dudko, Daniil A.; Zverev, Anatoly I.; Astakhov, Evgeny A.; and Pulyaevsky, Georgy G., 4,258,091, Cl. 427-422.000.

Punja, Nazim, to Imperial Chemical Industries Limited. 4-Halo-3,3-dimethyl-6,6,6-trihalohexanoate intermediates. 4,257,975, Cl. 260-465.400.

Purr, Gerhard: *See—*
Trassl, Werner; Purr, Gerhard; and Scheffczyk, Helmut, 4,257,234, Cl. 60-719.000.

Pyman, Ronald L.: *See—*
Barreiro, Agustin J.; Lowe, Charles M. T.; LeFever, JoAnne; and Pyman, Ronald L., 4,258,012, Cl. 423-8.000.

Pyrih, Roman Z.; Rickard, Robert S.; and Carrington, Orin F., to Earth Sciences Inc. Uranium recovery from wet process phosphoric acid. 4,258,013, Cl. 423-10.000.

Pyrih, Roman Z.; Rickard, Robert S.; and Carrington, Orin F., to Earth Sciences, Inc. Process for recovering uranium from wet process phosphoric acid. 4,258,014, Cl. 423-10.000.

Pyrih, Roman Z.; Rickard, Robert S.; and Carrington, Orin F., to Earth Sciences, Inc. Recovering uranium from wet process phosphoric acid with alkylphenyl phosphates. 4,258,015, Cl. 423-10.000.

Quan, Peter M.; Hunter, James S.; Lawson, John R.; and Moore, John H., to Imperial Chemical Industries Limited. Process for the manufacture of cyano azo dyes. 4,257,944, Cl. 260-207.100.

Quella, Ferdinand: *See—*
Greubel, Waldemar; and Quella, Ferdinand, 4,257,676, Cl. 350-96.340.

Quinton, Carrol D.; and Guio, Raphael, to Bunker Ramo Corporation. Metal plating process. 4,257,853, Cl. 204-32.00R.

R. Alkan & Cie: *See—*
Hasquenoph, Jean H.; and Coutin, Pierre F., 4,257,567, Cl. 244-137.00R.

R. J. Reynolds Tobacco Company: *See—*
White, Jackie L., 4,257,431, Cl. 131-140.00P.

R. W. Lyall & Co., Inc.: *See—*
Hill, Donald C.; and Lyall, Robert W., 4,257,452, Cl. 137-514.700.

Rabinovich, Vladimir B.: *See—*
Semashko, Andrei P.; Gimaev, Nasikh Z.; Maximov, Ivan V.; Bezrukov, Sergei V.; and Rabinovich, Vladimir B., 4,257,865, Cl. 204-224.00M.

Rabourn, Warren J.: *See—*
Prather, Richard A.; Williams, David L.; Partin, Robert M.; and Rabourn, Warren J., 4,258,169, Cl. 528-72.000.

Racciato, Joseph S.; and Yin, Robert I., to Merck & Co., Inc. Novel blend of algin and TKP. 4,257,768, Cl. 8-561.000.

Radow, Robert S.: *See—*
Panken, Irving; Radow, Robert S.; and Briddell, Brian J., 4,257,329, Cl. 101-473.000.

Radunz, Hans-Eckart: *See—*
Gante, Joachim; Radunz, Hans-Eckart; Orth, Dieter; Minck, Klaus; Wild, Albrecht; and Klockow, Michael, 4,258,047, Cl. 424-250.000.

Rain Bird Sprinkler Mfg. Corp.: *See—*
Maple, Steven E.; and Mendoza, Enric C., 4,257,629, Cl. 285-12.000.

Rainone, Nicholas J., to Westinghouse Electric Corp. Flash lamp array with improved switch mounting. 4,257,764, Cl. 431-359.000.

Rak, Stanley F.; and DeVale, Donald P., to Culligan International Company. Circuit and apparatus for controlling a water softener. 4,257,887, Cl. 210-96.100.

Raleigh, William J.: *See—*
Traver, Frank J.; and Raleigh, William J., 4,258,102, Cl. 428-331.000.

Ramey, Carol. Cushioned structure and method of testing thereof. 4,257,408, Cl. 128-32.000.

Ramm, Claus, to Siemens Aktiengesellschaft. Liquid ring compressor or vacuum pump. 4,257,749, Cl. 417-68.000.

Ramsey, Paul W.; and Bollinger, John G., to A. O. Smith Corporation. Self-programmed mechanical working apparatus. 4,258,425, Cl. 364-513.000.

Randazza, Ronald J.: *See—*
Habegger, William, 4,257,352, Cl. 119-5.000.

Rapp, Willard E., to Western Electric Co., Inc. Cleanable filter and method of cleaning same. 4,257,901, Cl. 210-791.000.

Rasada, Frank M., Jr.; and Starr, John A. Bunk ladder anchor. 4,257,492, Cl. 182-206.000.

Rasmussen, Carl M. Tie down assembly. 4,257,570, Cl. 248-503.000.

Ratcliffe, Ronald W.: *See—*
Christensen, Burton G.; and Ratcliffe, Ronald W., 4,258,040, Cl. 424-246.000.

Raux, Jean-Claude: *See—*
Prevot, Julien; and Raux, Jean-Claude, 4,258,328, Cl. 330-149.000.

Ray, Charles W. Fluid flow shut-off system. 4,257,446, Cl. 137-368.000.

Raymond, Frank E.: *See—*
Ferguson, Hugo S.; and Raymond, Frank E., 4,257,214, Cl. 56-13.400.

Raymond, Joseph H., Jr., to Texas Instruments Incorporated. Multiphase clocking for MOS electronic calculator or digital processor chip. 4,258,429, Cl. 364-900.000.

RCA Corporation: *See—*
Fujimoto, Kay K., 4,258,327, Cl. 329-101.000.
Kessler, Sebastian W., Jr., 4,258,383, Cl. 357-82.000.
Month, Alfred; and Kaiser, Donald B., 4,258,284, Cl. 313-390.000.
Simshauser, Elvin D., 4,258,233, Cl. 369-33.000.

Reaktor-Brennelement Union GmbH: *See—*
Sondermann, Thomas, 4,258,021, Cl. 423-261.000.

Realex Corporation: *See—*
Frazier, Steven P., 4,257,883, Cl. 209-664.000.

Rechmeier, Gerhard; Roesnik, Ulrich; and Scholz, Harald, to Hoechst Aktiengesellschaft. Purification of 1,2-dichloroethane recovered in the incomplete thermal cracking to vinyl chloride. 4,257,850, Cl. 203-29.000.

Reddy, Scott M.: *See—*
Griffith, Denis J.; and Reddy, Scott M., 4,257,432, Cl. 131-173.000.

Redifon Flight Simulation Limited: *See—*
Gasson, Roy A., 4,257,756, Cl. 425-384.000.

Reed, Robert D., to John Zink Company. Low NOx burner. 4,257,763, Cl. 431-188.000.

Reed, Robert D.: *See—*
Zink, John S.; Reed, Robert D.; Glomm, Horst M.; and Sawatski, Klaus E., 4,257,762, Cl. 431-177.000.

Regensburger, Werner, to SFS Stadler AG. Hole-drilling self-tapping screw. 4,257,307, Cl. 411-387.000.

Regnault, Alain; Sachetto, Jean-Pierre; Tournier, Herve; Hamm, Thomas; and Armanet, Jean-Michel, to Battelle Memorial Institute. Process and apparatus for continuous acid hydrolysis and saccharification. 4,257,818, Cl. 127-1.000.

Rehder, Wolfgang: *See—*
Fischer, Martin; Kuesters, Werner; Penzel, Erich; Rehder, Wolfgang; and Trautmann, Walter, 4,257,859, Cl. 204-159.230.

Reilly, Edward L., to Du Pont de Nemours, E. I., and Company. Oxidation of phenol to p-benzoquinone in acetonitrile/methanol cosolvent. 4,257,968, Cl. 260-396.00R.

Reinehr, Dieter: *See—*
Pfeifer, Josef; and Reinehr, Dieter, 4,258,176, Cl. 528-338.000.

Reinehr, Ulrich; and Druschke, Frank, to Bayer Aktiengesellschaft. Process for the production of hydrophilic filaments and fibres by the dry jet wet-spinning method. 4,257,999, Cl. 264-203.000.

Reinert, Charles P., to Solarein, Inc. Solar collector. 4,257,396, Cl. 126-426.000.

Reinhard, Freisleben, to Soding TV GmbH & Co. Bild & Ton International. Projection system. 4,257,694, Cl. 353-78.000.

Reliable Security Systems, Inc.: *See—*
Logan, Emanuel, Jr., 4,257,631, Cl. 292-251.500.
Logan, Emanuel, Jr., 4,257,631, Cl. 292-251.500.

Remot University Authority for Applied Research & Industrial Develop. Ltd.: *See—*
Wygnanski, Israel; and Fiedler, Heinrich, 4,257,224, Cl. 60-204.000.

Rempel, Cornelius: *See—*
Schmitt, Arnold J.; and Rempel, Cornelius, 4,257,844, Cl. 162-305.000.

Remy, David C.: *See—*
Engelhardt, Edward L.; and Remy, David C., 4,258,211, Cl. 564-379.000.

Repa Feinstanzwerk GmbH: *See—*
Adomeit, Heinz D., 4,257,626, Cl. 280-806.000.

Research Corporation: *See—*
Davidson, James P.; Rosenberg, Barnett; and Hinz, Ronald W., 4,258,051, Cl. 424-287.000.
Nicolaou, Kyriacos C.; Barnette, William E.; Magolda, Ronald L.; and Lysenko, Zenon, 4,258,199, Cl. 549-51.000.

Reuschling, Dieter-Bernd: *See—*
Bartmann, Wilhelm; Beck, Gerhard; Reuschling, Dieter-Bernd; Seeger, Karl; and Teufel, Hermann, 4,258,053, Cl. 424-275.000.

Reutler, Herbert: *See—*
Lukaszewicz, Johannes; Muller-Frank, Ulrich; and Reutler, Herbert, 4,257,845, Cl. 176-58.0PB.

Reverchon, Christian: *See—*
Reverchon, Michel; and Reverchon, Christian, 4,257,726, Cl. 414-104.000.

Reverchon, Michel; and Reverchon, Christian. Apparatus for storing and emplacing floor plates, particularly for amusement rides. 4,257,726, Cl. 414-104.000.

Revere Copper and Brass Incorporated: *See*—
Jenks, Richard H., 4,257,459, Cl. 138-147.000.

Reymore, Harold E., Jr.: *See*—
McLaughlin, Alexander; Richter, Reinhard H.; and Reymore, Harold E., Jr., 4,257,995, Cl. 264-122.000.

Reynard, Kennard A.; and Gerber, Arthur H., to Firestone Tire & Rubber Company, The. Catalyst for preparation of soluble poly(dichlorophosphazenes). 4,257,917, Cl. 252-435.000.

Rhoads, Stanley C.: *See*—
Siemens, Richard E.; Nilsen, David; and Rhoads, Stanley C., 4,258,016, Cl. 423-24.000.

Rhodes, John D.: *See*—
Levy, Ralph; and Rhodes, John D., 4,258,435, Cl. 370-72.000.

Rhone-Poulenc Industries: *See*—
Mirabel, Bernard; and Meiller, Francois, 4,258,133, Cl. 435-176.000.
Prudhon, Francois; and Scicluna, Augustin, 4,257,339, Cl. 110-346.000.

Rhyan, William C., to Clarke Carrier Corporation. Shopping basket for a wheelchair. 4,257,545, Cl. 224-42.430.

Ribaudo, Charles; Leccacorvi, John F.; and Gilbert, Everett E., to United States of America, Army. Process for recovering TNT isomers. 4,258,224, Cl. 568-935.000.

Richard, Donald P.: *See*—
Buldini, Daniel A.; and Richard, Donald P., 4,258,263, Cl. 250-480.000.

Richardson, Carol L.; and Schulman, Gail E., to Meloy Laboratories, Inc. Intercalation inhibition assay for compounds that interact with DNA or RNA. 4,257,774, Cl. 23-230.00B.

Richardson, Steven R., to Therm-O-Disc, Incorporated. Thermostat and method of testing thereof. 4,258,325, Cl. 324-417.000.

Richter, Reinhard H.: *See*—
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McLaughlin, Alexander; Richter, Reinhard H.; and Reymore, Harold E., Jr., 4,257,995, Cl. 264-122.000.

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Pyrih, Roman Z.; Rickard, Robert S.; and Carrington, Orin F., 4,258,013, Cl. 423-10.000.
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Ricoh Company, Ltd.: *See*—
Ejiri, Kouichi; and Sekigawa, Keiji, 4,258,393, Cl. 358-283.000.
Ishikawa, Chuji, 4,258,372, Cl. 346-153.100.
Kawa, Ryuichi, 4,258,301, Cl. 318-594.000.
Nakajima, Yoshinori, 4,257,711, Cl. 400-306.000.

Ridgway, John A., Jr.; and Weisrock, William P., to Standard Oil Company (Indiana). Method for inhibiting microbial growth in food processes. 4,258,070, Cl. 426-495.000.

Rieber, Norbert: *See*—
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,257,941, Cl. 260-152.000.

Rieger, Martin C., to Childers Products Company, Inc. Prefabricated insulated panel and wall structure produced therefrom. 4,257,204, Cl. 52-395.000.

Rieppel, Perry; and Sadauskas, Raymond, to Arcair Company. Method for reducing operating noise of the air-carbon arc cutting and gouging process. 4,258,244, Cl. 219-69.00M.

Riese, Hans-Walter, to Fichtel & Sachs AG. Disk clutch with two driven disks. 4,257,502, Cl. 192-70.250.

Rijckaert, Albert M. A., to U.S. Philips Corporation. Device for the generation of a control voltage across a piezo-electric positioning element. 4,258,282, Cl. 310-317.000.

Riker Laboratories, Inc.: *See*—
Hammar, Walton J.; and Rustad, Mark A., 4,258,213, Cl. 568-331.000.

Rite-Hite Corporation: *See*—
Hipp, Steven J.; and Wilde, Richard C., 4,257,137, Cl. 14-71.300.

Ritzmann, Horst; Bauer, Klaus; Schmits, Heinz-Herbert; Goldmann, Wolf; and Korn, Hennig, to Polysius AG. Processes and apparatus for the heat treatment of fine-grained material. 4,257,766, Cl. 432-14.000.

Robert Bosch GmbH: *See*—
Eggert, Albert; and Schmidt, Wolfgang, 4,258,229, Cl. 179-1.0ST.
Zeller, Hans, 4,257,363, Cl. 123-423.000.

Roberts, Jerry T. Spring pressure adjusting tool for can closing machine. 4,257,341, Cl. 113-7.00R.

Roberts, John S.; McKay, Dwight L.; Bertus, Brent J.; and Mark, H. Wayne, to Phillips Petroleum Company. Method of transferring a passivating agent to or from a cracking catalyst. 4,257,919, Cl. 252-461.000.

Robertshaw Controls Company: *See*—
Sliger, Boyd P.; and Steele, Everett T., Jr., 4,257,553, Cl. 236-34.500.

Robinson, Ken K.: *See*—
Kim, Dae K.; Bertolacini, Ralph J.; Gutberlet, L. Charles; and Robinson, Ken K., 4,257,922, Cl. 252-465.000.

Robinson, William P.; and Seliger, Robert L., to Hughes Aircraft Company. Ion implantation system. 4,258,266, Cl. 250-492.00A.

Rockwell International Corporation: *See*—
Hankosky, Andrew; Clapper, Robert L.; and Bake, Earl A., 4,257,714, Cl. 403-31.000.
Juhasz, John E.; and Williams, Hansel O., 4,258,421, Cl. 364-424.000.
Stock, William H., 4,257,639, Cl. 294-83.00R.

Rocroi, Jean-Pierre; and Cecchini, Andre, to Compagnie Generale de Geophysique. Electromagnetic subsoil prospecting process using an asymptotic low frequency range. 4,258,322, Cl. 324-335.000.

Roder, Hugh H.; Denningmann, Elroy; and Thornhill, Dewey B., to Boise Cascade Corporation. Method for pre-cutting labels for composite containers. 4,257,316, Cl. 493-68.000.

Roesch, Egon: *See*—
Witte, Ernst-Christian; Wolff, Hans P.; Thiel, Max; Stegmeier, Karlheinz; and Roesch, Egon, 4,258,058, Cl. 424-309.000.

Roesnik, Ulrich: *See*—
Rechmeier, Gerhard; Roesnik, Ulrich; and Scholz, Harald, 4,257,850, Cl. 203-29.000.

Roger, Bernard P., to U.S. Philips Corporation. Bipolar transistor having an integrated resistive emitter zone. 4,258,380, Cl. 357-51.000.

Roley, Robert D.: *See*—
Adams, Carl P.; and Roley, Robert D., 4,257,621, Cl. 280-495.000.

Rolls-Royce Limited: *See*—
Guy, Kenneth R.; Broom, Terence W.; and Maggs, Peter J., 4,257,734, Cl. 415-115.000.

Roman, Steven A., to Shell Oil Company. Cyclopropanecarboxylate pesticides preparation. 4,258,207, Cl. 560-238.000.

Root, Roland L.: *See*—
Morris, Earl F.; Free, Dustin L.; Root, Roland L.; and Griffin, Thomas J., Jr., 4,257,483, Cl. 166-292.000.

Ropte, Eckhard: *See*—
Jarre, Wolfgang; Mueller, Gerhard; Zipp, Otmar; and Ropte, Eckhard, 4,258,141, Cl. 521-114.000.

Rosa, Giovanni; and Brando, Pasquale, to Saipem, S.p.A. Semi-submersible pipelaying craft equipped for laying pipes on sea beds, including deep beds, and the method of operation. 4,257,718, Cl. 405-167.000.

Rosenberg, Barnett: *See*—
Davidson, James P.; Rosenberg, Barnett; and Hinz, Ronald W., 4,258,051, Cl. 424-287.000.

Rosenberg, Sheldon R. Security device. 4,257,633, Cl. 292-304.000.

Rosencwaig, Allan: *See*—
Hendricks, Charles D.; Koo, Jackson C.; and Rosencwaig, Allan, 4,257,798, Cl. 65-21.400.

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Zielke, Clyde W.; and Rosenhoover, William A., 4,257,914, Cl. 252-415.000.

Ross, John M.; Gupta, Kedar P.; Kramer, Horst G.; and Burd, John W., to Monsanto Company. Stabilizing and supporting apparatus for float zone refined semiconductor crystal rod. 4,257,841, Cl. 156-620.000.

Ross Operating Valve Company: *See*—
Cameron, Russell J., 4,257,455, Cl. 137-596.160.

Rossing, Martin A.: *See*—
McDonald, Ray S.; and Rossing, Martin A., 4,257,423, Cl. 128-419.0PG.

Rothhaas, Friedrich; and Pichler, Gunther, to Sistemco N.V. Fire protection cabinet. 4,257,656, Cl. 312-214.000.

Roto-Finish Company, Inc.: *See*—
Balz, Gunther W., 4,257,198, Cl. 51-313.000.

Rottenkolber, Hans, to Opto Produkte AG. Tire checking apparatus. 4,257,264, Cl. 73-146.000.

Roussel Uclaf: *See*—
Costerousse, Germain; and Teutsch, Jean G., 4,257,948, Cl. 260-239.55R.
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,257,978, Cl. 260-544.00L.
Nedelec, Lucien; Torelli, Vesperto; Fournex, Robert; and Tournemine, Colette, 4,258,039, Cl. 424-241.000.
Pavan, Charles; and Bulidon, Jacques, 4,257,976, Cl. 260-501.170.

Rowe International, Inc.: *See*—
Kurimsky, Albert, 4,257,657, Cl. 312-291.000.

Rozsa, Laszlo; Meszaros, Lajos; and Mogyorodi, Ferenc, to Eszakmagyarorszagi Vegyimu vek. Solvent extraction apparatus. 4,258,010, Cl. 422-257.000.

Rubin, Howard. Portable nebulizer treatment apparatus. 4,257,415, Cl. 128-200.210.

Rudkin-Wiley Corporation: *See*—
Wiley, Nathaniel C., 4,257,640, Cl. 296-1.00S.

Ruhrchemie Aktiengesellschaft: *See*—
Bahrmann, Helmut; Cornils, Boy; Dickhaus, Gerhard; Kascha, Waldemar; and Weber, Jurgen, 4,258,214, Cl. 568-454.000.

Ruiz, Javier R.: *See*—
Sullivan, James L.; and Ryan, David S., 4,257,590, Cl. 272-117.000.

Runyan, Gary L., to Celanese Corporation. Rotary ball valve having seating rings. 4,257,575, Cl. 251-292.000.

Rush, Olinda W.: *See*—
Mathur, Krishna K.; and Rush, Olinda W., 4,257,817, Cl. 106-266.000.

Rustad, Mark A.: *See*—
Hammar, Walton J.; and Rustad, Mark A., 4,258,213, Cl. 568-331.000.

Ruyle, William V.: *See*—
Poe, Martin; and Ruyle, William V., 4,258,045, Cl. 424-251.000.

Ryan, David S.: *See*—
Sullivan, James L.; and Ryan, David S., 4,257,590, Cl. 272-117.000.
Ryan, Franklin P., Sr.: *See*—
Cheatham, Welford T., Jr.; and Ryan, Franklin P., Sr., 4,258,313, Cl. 324-51.000.
Ryan, James P., to Codman & Shurtleff, Inc. Biopsy specimen collector. 4,257,425, Cl. 128-758.000.
Ryu, Toshihiko, to Nippon Electric Co., Ltd. Amplitude equalizer. 4,258,340, Cl. 333-18.000.
S J Marketing, Inc.: *See*—
Souza, David W., 4,257,541, Cl. 222-362.000.
Saarbergwerke Aktiengesellschaft: *See*—
Jorzyk, Sigurd; and Wurfel, Helmut, 4,257,870, Cl. 208-39.000.
Saat-und Erntetechnik GmbH: *See*—
Grimm, Hans; and Dabrowski, Ralf, 4,258,074, Cl. 427-4.000.
Sachetto, Jean-Pierre: *See*—
Regnault, Alain; Sachetto, Jean-Pierre; Tournier, Herve; Hamm, Thomas; and Armanet, Jean-Michel, 4,257,818, Cl. 127-1.000.
Sadauskas, Raymond: *See*—
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Saint Gobain Industries: *See*—
Delcoigne, Adrien; and Lanneau, Jacques, 4,257,710, Cl. 366-8.000.
Saipem, S.p.A.: *See*—
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Saito, Takashi: *See*—
Magome, Tamotsu; and Saito, Takashi, 4,258,115, Cl. 430-125.000.
Saito, Tohru: *See*—
Fujimori, Shigeo; Saito, Tohru; Otani, Kozaburo; and Nagatani, Taizi, 4,258,242, Cl. 219-61.000.
Saito, Yasuhisa: *See*—
Tanimura, Shozo; Saito, Yasuhisa; Horiuchi, Hiroshi; Mieno, Kazunori; Nakao, Shinji; Nakano, Takaaki; and Kamei, Kenzo, 4,257,926, Cl. 260-3.000.
Saitou, Tadashi: *See*—
Sakamaki, Hiroshi; Maeda, Yoshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, 4,257,753, Cl. 418-133.000.
Sakaguchi, Makoto: *See*—
Eguchi, Hajime; Furukawa, Hideko; Miyanishi, Toshiaki; and Sakaguchi, Makoto, 4,258,072, Cl. 426-537.000.
Sakai, Katzuji: *See*—
Sogo, Yukio; Ido, Kazuo; Taneda, Kozo; Sakai, Katzuji; and Sato, Yoichiro, 4,257,786, Cl. 55-261.000.
Sakai, Kazuaki: *See*—
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Sakakibara, Shumpei, to Ajinomoto Co., Inc. Peptide derivative. 4,257,939, Cl. 260-112.50R.
Sakamaki, Hiroshi; Maeda, Yoshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary fluid vane pump with means preventing axial displacement of the drive shaft. 4,257,753, Cl. 418-133.000.
Sakamoto, Hitoshi, to Sony Corporation. Circuit for forming a vertical synchronizing signal. 4,258,389, Cl. 358-154.000.
Salen Energy AB: *See*—
Tornkvist, Rolf E. A., 4,258,270, Cl. 290-53.000.
Samel, Ulf-Rainer: *See*—
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,257,941, Cl. 260-152.000.
Samokhin, Gennady P.: *See*—
Berezin, Ilia V.; Goldmakher, Viktor S.; Klibanov, Alexandr M.; Martinek, Karel; Mishin, Alexandr A.; Samokhin, Gennady P.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; and Chazov, Evgeny I., 4,257,269, Cl. 73-606.000.
Sampson, John S. Gasoline fill cover holding arm. 4,257,642, Cl. 296-1.00C.
Sanchez, Anastacio V. Apparatus for repairing deformed yieldable structures. 4,257,255, Cl. 72-455.000.
Sano, Takumi: *See*—
Shibuya, Chisei; Ishii, Kunihiko; Sano, Takumi; and Ishida, Torao, 4,258,195, Cl. 548-136.000.
Sarges, Reinhard, to Pfizer Inc. Hydantoin derivatives as therapeutic agents. 4,258,054, Cl. 424-273.00R.
Sasaki, Koji; and Harada, Yasukazu, to Zeria-Shinyaku Kogyo Kabushiki Kaisha. Urokinase preparation for oral administration. 4,258,030, Cl. 424-94.000.
Sata, Toshio: *See*—
Yoshida, Tetsuo; Ogura, Toshiyuki; Tajiri, Shinji; and Sata, Toshio, 4,257,317, Cl. 93-40.000.
Sato, Masaaki, to Olympus Optical Co., Ltd. Small size tape recorder with adapter. 4,258,402, Cl. 360-137.000.
Sato, Shigeru: *See*—
Nagashima, Akira; and Sato, Shigeru, 4,258,123, Cl. 430-281.000.
Sato, Toshihiko; Ishida, Yoichi; and Iwashita, Kanau, to Honda Giken Kogyo Kabushiki Kaisha. Secondary air controlling apparatus for internal combustion engines. 4,257,227, Cl. 60-290.000.
Sato, Toshio: *See*—
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Sato, Tuneyasu: *See*—
Matsuura, Ryo; Sakai, Kazuaki; Sato, Tuneyasu; Yamada, Yorinobu; and Bandow, Kowzo, 4,257,851, Cl. 203-31.000.
Sato, Yasushi: *See*—
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Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Label positioning mechanism for a label printing machine. 4,257,326, Cl. 101-288.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Label strip inserting device. 4,257,327, Cl. 101-288.000.
Sato, Yoichiro: *See*—
Sogo, Yukio; Ido, Kazuo; Taneda, Kozo; Sakai, Katzuji; and Sato, Yoichiro, 4,257,786, Cl. 55-261.000.
Saunders, William T., to National Steel Corporation. Easy-open retained tab structure for beverage can. 4,257,529, Cl. 220-269.000.
Saunier Duval: *See*—
Gouyou-Beauchamps, Jacques, 4,257,397, Cl. 126-427.000.
Saveliev, Jury V.: *See*—
Shirokov, Vasily I.; Maljutin, Gennady G.; Mishiev, Ilyasaf I.; Koshkin, Nikolai N.; Abdullaeva, Farida S.; Stukalenko, Anatoly K.; Novichkov, Alexandr N.; and Saveliev, Jury V., 4,257,794, Cl. 62-28.000.
Savin, Robert S.: *See*—
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Sawa, Utazi: *See*—
Nishimura, Nobuzi; Tsuji, Masayuki; Konishi, Seizo; Yamamoto, Tadashi; Tokieda, Takemi; Sawa, Utazi; and Koumura, Suketsugu, 4,257,770, Cl. 8-549.000.
Sawada, Daisaku; Shigematu, Takashi; and Takeda, Yuji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and system for controlling ignition timing. 4,257,364, Cl. 123-425.000.
Sawatski, Klaus E.: *See*—
Zink, John S.; Reed, Robert D.; Glomm, Horst M.; and Sawatski, Klaus E., 4,257,762, Cl. 431-177.000.
Scales, John T.; and Wright, Keith W. J., to National Research Development Corporation. Endoprosthetic knee joint. 4,257,128, Cl. 3-1.911.
Schatzler, Walter, to Webasto-Werk W. Baier GmbH and Co. Sliding cover for motor vehicles. 4,257,646, Cl. 296-222.000.
Schauer, Friedrich; and Wolff, Manfred, to Kabel-und Metallwerke Gutehoffnungshutte AG. Plug. 4,257,666, Cl. 339-218.00M.
Schaumburg, Hanno, to U.S. Philips Corporation. Method of manufacturing semiconductor devices having improvements in device reliability by thermally treating selectively implanted test figures in wafers. 4,257,825, Cl. 148-1.500.
Scheel, Rudiger: *See*—
Meurer, Peter; Hater, Martin; Meininghaus, Fritz; and Scheel, Rudiger, 4,257,898, Cl. 210-751.000.
Scheffczyk, Helmut: *See*—
Trassl, Werner; Purr, Gerhard; and Scheffczyk, Helmut, 4,257,234, Cl. 60-719.000.
Scheier, Donald J.: *See*—
Hathorn, Jack L.; and Scheier, Donald J., 4,257,142, Cl. 17-11.000.
Schemel, H. Method of producing fibre-reinforced concrete and shaped parts produced by this method. 4,257,993, Cl. 264-112.000.
Schenk, Alan G. Iris retractor and pupil dilator. 4,257,406, Cl. 128-20.000.
Schenk, William N., to B. F. Goodrich Company, The. Process for preparing polysulfide chain terminator. 4,258,212, Cl. 568-22.000.
Schering Aktiengesellschaft: *See*—
Arndt, Friedrich; and Boroschewski, Gerhard, 4,257,803, Cl. 71-100.000.
Arndt, Friedrich; and Nusslein, Ludwig, 4,257,804, Cl. 71-106.000.
Schiavone, Lawrence M.: *See*—
Beni, Gerardo; Dautremont-Smith, William C.; Schiavone, Lawrence M.; and Shay, Joseph L., 4,257,856, Cl. 204-129.000.
Schildkraut, Alan L.: *See*—
Brush, Robert W.; Werth, Dee A.; and Schildkraut, Alan L., 4,257,663, Cl. 339-89.00M.
Schlauer, Johann: *See*—
Hiller, Heinz; Schlauer, Johann; Doerges, Alexander; Kempf, Georg; Svoboda, Vaclav; and Zeschmar, Winfried, 4,258,019, Cl. 423-223.000.
Schlegel Corporation: *See*—
Balogh, Thomas K., 4,257,645, Cl. 296-166.000.
Schlesinger, David H.: *See*—
Goldstein, Gideon; and Schlesinger, David H., 4,258,151, Cl. 525-327.000.
Goldstein, Gideon; and Schlesinger, David H., 4,258,152, Cl. 525-327.000.
Schliep, Hans-Jochen: *See*—
Jonas, Rochus; Becker, Karl-Heinz; Enenkel, Hans-Joachim; Minck, Klaus; and Schliep, Hans-Jochen, 4,258,062, Cl. 424-330.000.
Schmid, Josef; Lange, Ludwig; Klebe, Hans; and Schutte, Dieter, to Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler. Process for the pyrogenous production of very finely divided oxides of a metal and/or of a metalloid. 4,258,023, Cl. 423-336.000.
Schmidt, Herbert; Kurz, Erwin; Berger, Rudolf; and Pilz, Erich, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Garbage disposal vehicle with box beam supported tank. 4,257,728, Cl. 414-468.000.
Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. Novel compounds, processes and marking systems. 4,257,954, Cl. 260-326.12R.
Schmidt, Stephen R., to Copar Corporation. Jam detector. 4,258,250, Cl. 235-92.0PE.
Schmidt, Thomas W.: *See*—
Favre, John A.; and Schmidt, Thomas W., 4,258,427, Cl. 364-527.000.

Schmidt, Wolfgang: *See—*
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Schmits, Heinz-Herbert: *See—*
Ritzmann, Horst; Bauer, Klaus; Schmits, Heinz-Herbert; Goldmann, Wolf; and Korn, Hennig, 4,257,766, Cl. 432-14.000.
Schmitt, Arnold J.; and Rempel, Cornelius, to Beloit Corporation. Press section arrangement. 4,257,844, Cl. 162-305.000.
Schmitt, Paul W.: *See—*
Heller, Herbert; and Schmitt, Paul W., 4,258,230, Cl. 179-17.00A.
Schmitz, Cynthia Elaine: *See—*
Schmitz, John N., Sr., 4,257,611, Cl. 273-293.000.
Schmitz, John N., Sr., to Schmitz, Sr., John Nathaniel; Schmitz, Wanda Lee Wilcoxon; Schmitz, Cynthia Elaine; and McKenzie, Rebecca Lee Schmitz. Dominoes with concealable spots. 4,257,611, Cl. 273-293.000.
Schmitz, Sr., John Nathaniel: *See—*
Schmitz, John N., Sr., 4,257,611, Cl. 273-293.000.
Schmitz, Wanda Lee Wilcoxon: *See—*
Schmitz, John N., Sr., 4,257,611, Cl. 273-293.000.
Schneider, Gerhard: *See—*
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Schneider, Heinz-Walter: *See—*
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Schnell, Hans G., to Van Kooten B.V. Guide frame for a pile driving device. 4,257,488, Cl. 173-133.000.
Schnipelsky, Paul N.; and Jakubowicz, Raymond F., to Eastman Kodak Company. Chemical analyzer. 4,257,862, Cl. 204-195.00R.
Schnitzius, Klaus, to Stabilus GmbH. Pneumatic spring. 4,257,580, Cl. 267-65.00R.
Schnurrenberger, Emil: *See—*
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Scholl, Inc.: *See—*
Hartung, Donald E.; and Siegel, Arnold L., 4,257,176, Cl. 36-44.000.
Scholz, Harald: *See—*
Rechmeier, Gerhard; Roesnik, Ulrich; and Scholz, Harald, 4,257,850, Cl. 203-29.000.
Schonstedt, Erick O., to Schonstedt Instrument Company. Apparatus and method employing foam sleeves for supporting magnetic sensors in a tubular housing. 4,258,320, Cl. 324-262.000.
Schonstedt Instrument Company: *See—*
Schonstedt, Erick O., 4,258,320, Cl. 324-262.000.
Schott, Ansgar; Gras, Rainer; and Wolf, Elmar, to Chemisch Werke Huls AG. Process for the preparation of blocked polyisocyanates. 4,258,186, Cl. 544-253.000.
Schroeder, Karl S. Magnetically triggered and electronically controlled torsion brake. 4,257,497, Cl. 188-77.00W.
Schulman, Gail E.: *See—*
Richardson, Carol L.; and Schulman, Gail E., 4,257,774, Cl. 23-230.00B.
Schulte, Klaus; Ersfeld, Heinrich; and Wirtz, Hans, to Bayer Aktiengesellschaft. Method and an apparatus for the production of articles which consist of filler-containing synthetic material, in particular of foam. 4,257,992, Cl. 264-45.300.
Schulz, Donald N.; Cheng, Tai C.; and Antkowiak, Thomas A., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing monoetheroxy and polyetheroxy substituents. 4,258,173, Cl. 528-168.000.
Schutte, Dieter: *See—*
Schmid, Josef; Lange, Ludwig; Klebe, Hans; and Schutte, Dieter, 4,258,023, Cl. 423-336.000.
Schuurman, Hubert G.; Stott, James B.; and Gilmour, Ian A. Cyclone burners. 4,257,760, Cl. 431-158.000.
Schwabe, Ulrich; and Jacobs, Erwin, to Siemens Aktiengesellschaft. Process for producing an integrated multi-layer insulator memory cell. 4,257,832, Cl. 148-187.000.
Schwartz, Albert B.: *See—*
Dwyer, Francis G.; and Schwartz, Albert B., 4,258,218, Cl. 568-698.000.
Schwarz, Alois; and Mautz, Karlheinz, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Rotor mounting assembly for rotary wing aircraft. 4,257,738, Cl. 416-134.00A.
Schwarz, Frederick M., to United Technologies Corporation. Seal clearance control system for a gas turbine. 4,257,222, Cl. 60-39.020.
Schwuttke, Guenter H.; and Yang, Kuei-Hsiung, to International Business Machines Corporation. High efficiency gettering in silicon through localized superheated melt formation. 4,257,827, Cl. 148-1.500.
Scicluna, Augustin: *See—*
Prudhon, Francois; and Scicluna, Augustin, 4,257,339, Cl. 110-346.000.
SCM Corporation: *See—*
Jalbert, Vincent P., 4,258,356, Cl. 340-365.00R.
Scorteanu, Ionel R.; Spirea, Emil; and Cristea, Radu, to Institutul de Cergetari s Proiectari Technologice in Transporturi. Optical-electronic system for the identification of a retro-reflective label. 4,257,669, Cl. 350-6.800.
Scott, Burton W., to Mead Corporation, The. Document illumination apparatus. 4,258,396, Cl. 358-293.000.
Scott, Morris B. Chuck for machining equipment. 4,257,290, Cl. 82-40.00R.
Scott Paper Company: *See—*
Hosmer, William A.; and Bowler, William M., 4,258,103, Cl. 428-342.000.
Scott, Robert J.; and Craig, Bryant F., to Scott, Robert J. Smoke alarm activated portable lamp. 4,258,291, Cl. 315-156.000.
Scura, Edward D.; Kuljis, Andrew M.; and Courchesne, Roger L., to Aquatic Farms, Ltd. Bivalve production flume. 4,257,351, Cl. 119-4.000.
Sealectro Corporation: *See—*
Iantorno, James, 4,257,667, Cl. 339-221.00R.
Seath, Robert J. Rolling disk game. 4,257,602, Cl. 273-126.00R.
Sechrist, Mark A., to ACF Industries, Incorporated. Railway tank car cradle support. 4,257,332, Cl. 105-362.000.
Sedlaczek, Janusz; Krutki, Marian; and Olender, Kornel, to Centralny Osrodek Projektowokonstrukcyjny Maszyn Gorniczych "Komag". Coal combine. 4,257,649, Cl. 299-43.000.
Seefeld, Dean E.: *See—*
Burrough, Donald E.; Campbell, Hallis D.; and Seefeld, Dean E., 4,257,219, Cl. 56-341.000.
Seeger, Karl: *See—*
Bartmann, Wilhelm; Beck, Gerhard; Reuschling, Dieter-Bernd; Seeger, Karl; and Teufel, Hermann, 4,258,053, Cl. 424-275.000.
Seidel, Thomas E.: *See—*
Celler, George K.; and Seidel, Thomas E., 4,258,078, Cl. 427-43.100.
Seipp, Ronald W.: *See—*
Christiansen, David A.; Kiefer, Kevin W.; Naley, Lowell B.; Seipp, Ronald W.; Shirek, Lawrence J.; and Harrington, Robert L., 4,257,240, Cl. 62-448.000.
Seki, Kunio, to Hitachi, Ltd. Protecting circuit. 4,258,406, Cl. 361-79.000.
Seki, Shigeo: *See—*
Kai, Fumio; Tsuruoka, Takashi; Makabe, Osamu; Inouye, Shigeharu; Ikeda, Hitoshi; Kazuno, Yuzo; Nakajima, Shokichi; Seki, Shigeo; and Niida, Taro, 4,258,184, Cl. 544-27.000.
Sekigawa, Keiji: *See—*
Ejiri, Kouichi; and Sekigawa, Keiji, 4,258,393, Cl. 358-283.000.
Sekiguchi, Sadao; Matsumoto, Kojiro; Ishikawa, Tetsuo; Mishiba, Saburo; and Izaki, Nobujiro, to Sumitomo Naugatuck Co., Ltd. Color developing sheet for pressure-sensitive recording systems. 4,257,935, Cl. 260-29.70H.
Sekine, Yoichi; Kishimoto, Yoshio; and Shimotsuma, Wataru, to Matsushita Electric Industrial Co., Ltd. Image recording apparatus. 4,258,371, Cl. 346-140.00R.
Sekine, Yoichi: *See—*
Sonoda, Nobuo; Shimotsuma, Wataru; Kishimoto, Yoshio; and Sekine, Yoichi, 4,258,080, Cl. 427-82.000.
Sekiya, Fukuo; and Yamada, Takashi, to Citizen Watch Co., Ltd. Electronic timepiece having an analog display device and a digital display device. 4,258,431, Cl. 368-188.000.
Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Copolymers soluble in water in salt form and latex paints containing the same. 4,257,933, Cl. 260-23.00S.
Seliger, Robert L.: *See—*
Robinson, William P.; and Seliger, Robert L., 4,258,266, Cl. 250-492.00A.
Semashko, Andrei P.; Gimaev, Nasikh Z.; Maximov, Ivan V.; Bezrukov, Sergei V.; and Rabinovich, Vladimir B. Electrochemical working method and system for effecting same. 4,257,865, Cl. 204-224.00M.
Sencore, Inc.: *See—*
Westra, Marlin D., 4,258,315, Cl. 324-59.000.
Sepson Aktiebolag: *See—*
Eriksson, Erik; and Geschwind, Lennart, 4,257,577, Cl. 254-344.000.
Sertog Societe d'Etudes de Recherches de Travoux d'Organisation et de Gestion: *See—*
Juvin, Pierre, 4,258,037, Cl. 424-195.000.
Setoguchi, Shinro: *See—*
Nakao, Toru; Setoguchi, Shinro; and Yaoka, Osamu, 4,258,185, Cl. 544-114.000.
SFS Stadler AG: *See—*
Regensburger, Werner, 4,257,307, Cl. 411-387.000.
Shah, Raj: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,257,933, Cl. 260-23.00S.
Shannon, John M., to U.S. Philips Corporation. Charge coupled circuit arrangement using a punch-through charge introduction effect. 4,258,376, Cl. 357-24.000.
Sharp Kabushiki Kaisha: *See—*
Kuwagaki, Hiroshi; Hamada, Hiroshi; Takechi, Sadatoshi; and Yano, Kohzo, 4,257,683, Cl. 350-357.000.
Nishiyama, Mitsuru, 4,257,684, Cl. 350-357.000.
Oka, Takashi; and Morimoto, Hiroshi, 4,257,179, Cl. 40-378.000.
Shaw, David N., to Dunham-Bush, Inc. Compressor heat pump system with maximum and minimum evaporator ΔT control. 4,257,795, Cl. 62-150.000.
Shaw, Seth T., Jr. IUD Arrangement. 4,257,413, Cl. 128-130.000.
Shay, Joseph L.: *See—*
Beni, Gerardo; Dautremont-Smith, William C.; Schiavone, Lawrence M.; and Shay, Joseph L., 4,257,856, Cl. 204-129.000.
Sheldahl, Inc.: *See—*
LaMarche, Frederick W., 4,258,096, Cl. 428-209.000.
Shell Oil Company: *See—*
Pilgram, Kurt H., 4,257,805, Cl. 71-120.000.
Roman, Steven A., 4,258,207, Cl. 560-238.000.
Syrier, Johannes L. M., 4,257,956, Cl. 260-343.210.

Van Berkel, Johannes; and Kelderman, Hendrik C., 4,258,205, Cl. 560-231.000.

Sheng, Ming N.: *See—*
Kao, Jar-lin; and Sheng, Ming N., 4,258,208, Cl. 560-266.000.

Sheppard, Peter H. Power steering piston and cylinder combination with plastic wear surfaces. 4,257,313, Cl. 91-422.000.

Sherman, Alan E.; and Koeln, Harold E., to Penn Corporation. Conical pen. 4,257,713, Cl. 401-88.000.

Sherman, Charles J., to Bell Telephone Laboratories, Incorporated. Electronic device packaging arrangement. 4,258,411, Cl. 361-386.000.

Sherwood, Richard C.: *See—*
Bordelon, Chester M.; and Sherwood, Richard C., 4,258,234, Cl. 179-114.00R.

Shibata, Yukitake: *See—*
Kurita, Yoshio; and Shibata, Yukitake, 4,257,275, Cl. 73-861.060.

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Shigematu, Takashi: *See—*
Sawada, Daisaku; Shigematu, Takashi; and Takeda, Yuji, 4,257,364, Cl. 123-425.000.

Shigeta, Kiyoko; Matsumoto, Shuntetsu; Ooyama, Naotake; and Imai, Takashi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. System for collection and transmission of road traffic information. 4,258,351, Cl. 340-38.00P.

Shihabi, David S.: *See—*
La Pierre, Rene B.; Shihabi, David S.; and Smith, Robert L., 4,257,872, Cl. 208-59.000.

Shimada, Katsuhiko; Komine, Isamu; Tanabe, Hideya; Tsunozaki, Shuichi; Yamada, Masayoshi; and Takahashi, Tsuguo, to Nippon Kokan Kabushiki Kaisha. Surface defect detecting apparatus for use with rotating circularly shaped metallic material. 4,258,319, Cl. 324-226.000.

Shimada, Satoshi; Kawakami, Kanji; and Nishihara, Motohisa, to Hitachi, Ltd. Capacitive pressure sensor. 4,257,274, Cl. 73-718.000.

Shimada, Wataru; and Hoshinouchi, Susumu, to Mitsubishi Denki Kabushiki Kaisha. Method of producing welded joint including non-welded portion. 4,258,247, Cl. 219-137.00R.

Shimizu, Akira: *See—*
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,257,700, Cl. 355-3.0TR.

Shimizu, Hiroshi: *See—*
Suzuki, Takaharu; and Shimizu, Hiroshi, 4,257,682, Cl. 350-349.000.

Shimizu, Shigeki; and Oshima, Akinobu, to Mitsubishi Chemical Industries Ltd. Photosensitive composition. 4,258,124, Cl. 430-285.000.

Shimizu, Yoshikazu: *See—*
Tokuda, Kazuo; Watanabe, Hidetaro; and Shimizu, Yoshikazu, 4,258,311, Cl. 323-313.000.

Shimotsuma, Wataru: *See—*
Sekine, Yoichi; Kishimoto, Yoshio; and Shimotsuma, Wataru, 4,258,371, Cl. 346-140.00R.
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Shimp, Alan B., to Westinghouse Electric Corp. Ground fault circuit interrupter. 4,258,403, Cl. 361-42.000.

Shin-Shirasuna Electric Corp.: *See—*
Hirabayashi, Nobuhiro, 4,257,547, Cl. 226-110.000.

Shinoda, Naoharu: *See—*
Kimishima, Makoto; and Shinoda, Naoharu, 4,257,793, Cl. 55-394.000.

Shinohara, Satoru. Process for producing an agglutinating substance utilizing dematium ATCC 20524. 4,258,132, Cl. 435-101.000.

Shinohara, Toshio: *See—*
Arima, Heihachi; and Shinohara, Toshio, 4,257,868, Cl. 204-299.00R.

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Kawata, Hiroitsu; Ohmura, Tadayoshi; Shiozawa, Hiroyoshi; and Hattori, Munetaka, 4,258,179, Cl. 536-95.000.

Shirek, Lawrence J.: *See—*
Christiansen, David A.; Kiefer, Kevin W.; Naley, Lowell B.; Seipp, Ronald W.; Shirek, Lawrence J.; and Harrington, Robert L., 4,257,240, Cl. 62-448.000.

Shirokov, Vasily I.; Maljutin, Gennady G.; Mishiev, Ilyasaf I.; Koshkin, Nikolai N.; Abdullaeva, Farida S.; Stukalenko, Anatoly K.; Novichkov, Alexandr N.; and Saveliev, Jury V. Method of and apparatus for separating a gaseous hydrocarbon mixture. 4,257,794, Cl. 62-28.000.

Shiu, Chan K.; and Kwong, Leung W. Flow cut-off device for insertion in a gas duct. 4,257,448, Cl. 137-460.000.

Shoenberger, Ronald W.: *See—*
Brayton, William E.; Fun, Fay; Hendrickson, Luther G.; and Shoenberger, Ronald W., 4,257,848, Cl. 202-82.000.

Sholk, Semen F.: *See—*
Kudryavtsev, Boris B.; Krasnokutsky, Valentin P.; Fedotov, Lev A.; Sholk, Semen F.; Svidler, Jury R.; Zhigarev, Ivan V.; Begunov, Nikolai N.; Kostylev, Valentin F.; Brodsky, Jury M.; and Knyazev, Vadim A., 4,257,888, Cl. 210-97.000.

Shonerd, David E. Hydro-solar system for heating and cooling. 4,257,399, Cl. 126-429.000.

Short, Wilbur G., to Canron Corp. Shear back-gauging system. 4,257,296, Cl. 83-393.000.

Shroff, James R.: *See—*
Loev, Bernard; and Shroff, James R., 4,258,042, Cl. 424-248.500.

Siarto, Andrew V., to Siarto Machine and Tool Co., Inc. Machine tool. 4,257,513, Cl. 198-345.000.

Siarto Machine and Tool Co., Inc.: *See—*
Siarto, Andrew V., 4,257,513, Cl. 198-345.000.

Siegel, Arnold L.: *See—*
Hartung, Donald E.; and Siegel, Arnold L., 4,257,176, Cl. 36-44.000.

Siegenia-Frank KG: *See—*
Kucharczyk, Eckhard, 4,257,319, Cl. 98-37.000.

Siemens Aktiengesellschaft: *See—*
Grassman, Hans-Christian, 4,257,167, Cl. 34-1.000.
Greubel, Waldemar; and Quella, Ferdinand, 4,257,676, Cl. 350-96.340.
Klobe, Martin, 4,257,277, Cl. 73-861.240.
Liertz, Heinrich; Oestreich, Ulrich; and Zeidler, Guenter, 4,257,707, Cl. 356-73.100.
Noack, Dieter; and Oltersdorf, Winfried, 4,258,239, Cl. 200-148.00A.
Ramm, Claus, 4,257,749, Cl. 417-68.000.
Schwabe, Ulrich; and Jacobs, Erwin, 4,257,832, Cl. 148-187.000.
Walz, Alfred; and Birk, Adalbert, 4,257,270, Cl. 73-620.000.

Siemens, Richard E.; Nilsen, David; and Rhoads, Stanley C., to United States of America, Interior. Process for recovering Ni (II), Cu (II) and Co (II) from an ammoniacal-ammonium sulfate leach liquor. 4,258,016, Cl. 423-24.000.

Siglock, John V., to Unicorn Electrical Products. Timed ballast circuit for sodium vapor lamp. 4,258,295, Cl. 315-189.000.

Sigma Instruments, Inc.: *See—*
Beling, Thomas E., 4,258,276, Cl. 307-252.00B.

Sih, John C., to Upjohn Company, The. 19-Hydroxy-19-methyl-7,8-didehydro-PGI_1 compounds. 4,257,963, Cl. 260-346.220.

Sih, John C., to Upjohn Company, The. 19-Hydroxy-6,7-didehydro-PGI_1 compounds. 4,257,964, Cl. 260-346.220.

Sih, John C., to Upjohn Company, The. 19-Hydroxy-19-methyl-5-hydroxy-PGI compounds. 4,257,965, Cl. 260-346.220.

Sih, John C., to Upjohn Company, The. 19-Hydroxy-PG_2 analogs. 4,257,971, Cl. 260-404.000.

Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-19-hydroxy-19-methyl-PG compounds. 4,257,979, Cl. 564-454.000.

Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-19,20-didehydro-13,14-dihydro-PG_1 compounds. 4,257,980, Cl. 564-336.000.

Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-19,20-didehydro-PG_2 compounds. 4,257,981, Cl. 564-454.000.

Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-19,20-didehydro-13,14-dihydro-PG_2 compounds. 4,257,982, Cl. 564-453.000.

Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-19,20-didehydro-PG_1 compounds. 4,257,983, Cl. 564-346.000.

Siller, Vinzenz. Process for the continuous hardening of pump casings. 4,257,831, Cl. 148-134.000.

Silvestrova, Iraida M.: *See—*
Barta, Cestmir; Ctyroky, Jiri; Silvestrova, Iraida M.; and Pisarevskij, Jurij V., 4,257,685, Cl. 350-358.000.

Simjian, Luther G. Check controlled metering device. 4,258,252, Cl. 235-432.000.

Sims, Gary F. Boat propellor security device. 4,257,247, Cl. 70-232.000.

Simshauser, Elvin D., to RCA Corporation. Track skipper apparatus for video disc player. 4,258,233, Cl. 369-33.000.

Singer, Haimi N., to Singer & Hersch Industrial Development (Pty.) Ltd. Water-based industrial fluids. 4,257,902, Cl. 252-18.000.

Singer & Hersch Industrial Development (Pty.) Ltd.: *See—*
Singer, Haimi N., 4,257,902, Cl. 252-18.000.

Sistemco N.V.: *See—*
Rothhaas, Friedrich; and Pichler, Gunther, 4,257,656, Cl. 312-214.000.

Skala, Stephen F. Fluid heat transfer system. 4,257,556, Cl. 237-7.000.

SKF Kugellagerfabriken GmbH: *See—*
Mirring, Knut, 4,257,655, Cl. 308-216.000.

Skinner, Douglas A.: *See—*
MacPherson, Edwin J.; Alderson, Peter J.; and Skinner, Douglas A., 4,257,517, Cl. 198-497.000.

Sliger, Boyd P.; and Steele, Everett T., Jr., to Robertshaw Controls Company. Valve construction and method of making the same. 4,257,553, Cl. 236-34.500.

Slinkard, William E.; and Baylis, Anthony B., to Celanese Corporation. Catalyst for the oxidation of butene. 4,257,921, Cl. 252-462.000.

Sloan-Kettering Institute for Cancer Research: *See—*
Goldstein, Gideon; and Schlesinger, David H., 4,258,151, Cl. 525-327.000.
Goldstein, Gideon; and Schlesinger, David H., 4,258,152, Cl. 525-327.000.

Sloman, Anthony W., to E M I Limited. Ultrasonic apparatus. 4,257,272, Cl. 73-633.000.

Smearing, Robert W., to General Electric Company. Antifoaming resin compositions. 4,258,147, Cl. 525-122.000.

Smirnov, Vladimir N.: *See—*
Berezin, Ilia V.; Goldmakher, Viktor S.; Klibanov, Alexandr M.; Martinek, Karel; Mishin, Alexandr A.; Samokhin, Gennady P.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; and Chazov, Evgeny I., 4,257,269, Cl. 73-606.000.

Smith, Barry L., to UMC Industries, Inc. Coin dispensing apparatus having a U-shaped coin ejector. 4,257,436, Cl. 133-5.00R.

Smith, Curtis P.: *See—*
Farrissey, William J., Jr.; McLaughlin, Alexander; Richter, Reinhard H.; Smith, Curtis P.; and Tucker, Benjamin W., 4,257,996, Cl. 264-122.000.

Smith, Derrick A. No-heat clothes dryer. 4,257,173, Cl. 34-92.000.

Smith, Maurice I.; and Gillen, John D., to Tone Commander Systems, Inc. Line hold circuits. 4,258,232, Cl. 179-99.00R.
Smith, Robert L. Motor vehicle back-up limit gauging method and apparatus. 4,257,706, Cl. 356-3.000.
Smith, Robert L.: *See—*
La Pierre, Rene B.; Shihabi, David S.; and Smith, Robert L., 4,257,872, Cl. 208-59.000.
Smith, Thor L.: *See—*
Balanson, Richard D.; Economy, James; Huang, Samuel J.; and Smith, Thor L., 4,258,146, Cl. 525-106.000.
Smith, Wayne R., to Xerox Corporation. Document registering and feeding apparatus. 4,257,587, Cl. 271-236.000.
SmithKline Corporation: *See—*
Bondinell, William E.; and Girard, Gerald R., 4,258,049, Cl. 424-258.000.
Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., 4,257,947, Cl. 260-239.00A.
Gyurik, Robert J.; and Kingsbury, William D., 4,258,198, Cl. 548-306.000.
Smiths Industries Limited: *See—*
Barnsley, Michael P.; Eccles, Edward S.; and Taylor, Ralph, 4,257,311, Cl. 91-363.00A.
Snow Brand Milk Products Co., Ltd.: *See—*
Sogo, Yukio; Ido, Kazuo; Taneda, Kozo; Sakai, Katzuji; and Sato, Yoichiro, 4,257,786, Cl. 55-261.000.
Snyder, David E.: *See—*
Covington, Cecil E.; Snyder, David E.; Sonneborn, Walter G.; and Cresap, Wesley L., 4,257,739, Cl. 416-134.00A.
Snyder Industries, Inc.: *See—*
Snyder, Larry L.; and Hansen, LaVelle H., 4,257,527, Cl. 220-72.000.
Snyder, Larry L.; and Hansen, LaVelle H., to Snyder Industries, Inc. Plastic drum. 4,257,527, Cl. 220-72.000.
Snyder, Richard V., to Fel Corporation. Feed forward passive coupling system and method. 4,258,341, Cl. 333-109.000.
Societe d'Etudes et de Realisations Automobiles: *See—*
Choulet, Robert, 4,257,643, Cl. 296-1.00S.
Societe Francaise des Produits pour Catalyse: *See—*
Sugier, Andre; Courty, Philippe; and Freund, Edouard, 4,257,920, Cl. 252-462.000.
Societe Lignes Telegraphiques et Telephoniques: *See—*
Bernard, Nicolle; and Mahieu, Jean-Rene, 4,258,339, Cl. 333-1.100.
Prevot, Julien; and Raux, Jean-Claude, 4,258,328, Cl. 330-149.000.
Soding TV GmbH & Co. Bild & Ton International: *See—*
Reinhard, Freisleben, 4,257,694, Cl. 353-78.000.
Soehngen, John W.; and Ostrander, Kenneth, to Celanese Corporation. Solvent stretch process for preparing a microporous film. 4,257,997, Cl. 264-145.000.
Sogo, Yukio; Ido, Kazuo; Taneda, Kozo; Sakai, Katzuji; and Sato, Yoichiro, to Snow Brand Milk Products Co., Ltd. Cyclone separator. 4,257,786, Cl. 55-261.000.
Sokol, Louis, to Plymouth Products Incorporated. Universal trouble light. 4,258,414, Cl. 362-421.000.
Solarein, Inc.: *See—*
Reinert, Charles P., 4,257,396, Cl. 126-426.000.
Solid Waste Engineering Limited: *See—*
McDermott, Robert H., 4,257,322, Cl. 100-229.00A.
Soll Kommanditgesellschaft, Industrieschmiede: *See—*
Frankel, Manfred, 4,257,494, Cl. 187-89.000.
Solomin, Vladimir A.: *See—*
Popov, Alexandr D.; Solomin, Vladimir A.; and Mindin, Vladimir M., 4,258,278, Cl. 310-13.000.
Solomon, Donald F., to JO-Line Tools, Inc. Torque wrench with pawl guide. 4,257,507, Cl. 192-43.100.
Solvay & Cie: *See—*
Bienfait, Charles, 4,258,159, Cl. 526-114.000.
Sondermann, Thomas, to Reaktor-Brennelement Union GmbH. Method of producing UO_2 wherein methanol wash is provided. 4,258,021, Cl. 423-261.000.
Sonneborn, Walter G.: *See—*
Covington, Cecil E.; Snyder, David E.; Sonneborn, Walter G.; and Cresap, Wesley L., 4,257,739, Cl. 416-134.00A.
Sonoda, Nobuo; Shimotsuma, Wataru; Kishimoto, Yoshio; and Sekine, Yoichi, to Matsushita Electric Industrial Co., Ltd. Method of lowering resistivity of metal oxide semiconductor powder. 4,258,080, Cl. 427-82.000.
Sony Corporation: *See—*
Ohsaka, Yukio; and Ikeda, Takaharu, 4,258,309, Cl. 323-287.000.
Sakamoto, Hitoshi, 4,258,389, Cl. 358-154.000.
Takeda, Masashi; Hoshimi, Susumu; and Sato, Toshio, 4,258,299, Cl. 318-258.000.
Tatami, Mitsushige, 4,258,384, Cl. 358-16.000.
Souza, David W., to S J Marketing, Inc. Dispensing device for granular material. 4,257,541, Cl. 222-362.000.
Soworowski, David R., to Park-Ohio Industries, Inc. Slot furnace for inductively heating axially spaced areas of a workpiece. 4,258,241, Cl. 219-10.710.
Sperry Corporation: *See—*
Hilburn, Hugh C.; and Spilsbury, Thomas W., 4,258,298, Cl. 315-382.000.
Sperry Limited: *See—*
Coles, Peter H.; and Downton, Geoffrey C., 4,257,280, Cl. 74-5.60E.
Spies, Janice A. Method and compound for treatment of arthritic conditions in dogs. 4,258,035, Cl. 424-195.000.
Spilsbury, Thomas W.: *See—*
Hilburn, Hugh C.; and Spilsbury, Thomas W., 4,258,298, Cl. 315-382.000.
Spirea, Emil: *See—*
Scorteanu, Ionel R.; Spirea, Emil; and Cristea, Radu, 4,257,669, Cl. 350-6.800.
Spradlin, Shelby L. Height adjustable drum type dredging apparatus. 4,257,178, Cl. 37-70.000.
Squibbs, Robert F. Games and puzzles. 4,257,609, Cl. 273-241.000.
SRI International: *See—*
McCusker, Michael V.; Lorents, Donald C.; Hill, Robert M.; and Huestis, Davis L., 4,258,334, Cl. 331-94.50G.
Stabilus GmbH: *See—*
Schnitzius, Klaus, 4,257,580, Cl. 267-65.00R.
Wirges, Winfried, 4,257,582, Cl. 267-120.000.
Stadler, Istvan: *See—*
Szabo, Tibor; Institoris, Laszlo; Kovacs, Gabor; Dalmadi, Gyula; Koszegi, Bela; and Stadler, Istvan, 4,257,962, Cl. 260-346.220.
Staffanson, Leroy. Hay stacker. 4,257,732, Cl. 414-703.000.
Stahl, Werner, to Agfa-Gevaert Aktiengesellschaft. Process and apparatus for electrophotographic development of latent images on sheet-like carriers. 4,257,347, Cl. 118-662.000.
Stahl, William, to National Manufacturing Company Inc. Machine for trimming the edges of metal containers. 4,257,293, Cl. 83-193.000.
Stal-Laval Apparat AB: *See—*
Stendahl, Gunnar, 4,257,478, Cl. 165-104.00F.
Stampfli, Harald, to Lucifer S.A. Electromagnetic valve with servo-control. 4,257,573, Cl. 251-30.000.
Standard Oil Company (Indiana): *See—*
Allen, John K.; Palka, Agnes M.; and Lambers, Edward A., 4,258,227, Cl. 585-469.000.
Karayannis, Nicholas M.; and Lee, Sam S., 4,258,168, Cl. 526-139.000.
Lawrence, Dan D.; and Felber, Betty J., 4,257,813, Cl. 106-74.000.
Ridgway, John A., Jr.; and Weisrock, William P., 4,258,070, Cl. 426-495.000.
Stanton, Peter R. Testing apparatus for cassette type tape recorders. 4,257,262, Cl. 73-134.000.
Stanzione, Daniel C.: *See—*
Blahut, Donald E.; Copp, David H.; and Stanzione, Daniel C., 4,258,419, Cl. 364-200.000.
Starcevic, Mihailo, to BBC Brown Boveri & Company Limited. Supporting structure for slow speed large diameter electrical machines. 4,258,280, Cl. 310-157.000.
Starks, Charles M.: *See—*
Leach, Bruce E.; and Starks, Charles M., 4,258,220, Cl. 568-804.000.
Starks, Fred W.: *See—*
Dubicki, Henryk; Parsons, Jack L.; and Starks, Fred W., 4,258,191, Cl. 546-106.000.
Starr, John A.: *See—*
Rasada, Frank M., Jr.; and Starr, John A., 4,257,492, Cl. 182-206.000.
Statni banka ceskoslovenska: *See—*
Muzik, Vladimir, 4,257,300, Cl. 83-620.000.
Stauffer Chemical Company: *See—*
Powell, William J., 4,258,018, Cl. 423-210.000.
STB Transformer Company: *See—*
Belfer, Kenneth H.; Stewart, Arnold; and Tavare, Russell, 4,258,348, Cl. 336-73.000.
Steag, Kernergie GmbH: *See—*
Inaba, Kiyoharu, 4,258,381, Cl. 357-70.000.
Stedman, Robert N.: *See—*
Meisel, Thomas C., Jr.; and Stedman, Robert N., 4,257,653, Cl. 305-28.000.
Steele, Everett T., Jr.: *See—*
Sliger, Boyd P.; and Steele, Everett T., Jr., 4,257,553, Cl. 236-34.500.
Stefansson, Rafn; and Westover, Dwight G., to Bell & Howell Company. Position monitoring methods and apparatus. 4,257,324, Cl. 101-93.010.
Stegmeier, Karlheinz: *See—*
Witte, Ernst-Christian; Wolff, Hans P.; Thiel, Max; Stegmeier, Karlheinz; and Roesch, Egon, 4,258,058, Cl. 424-309.000.
Steiger, LeRoy A. Self-restoring, torque-limiting, torque-transmitting linkage. 4,257,595, Cl. 273-49.000.
Steinberg, Hy. Reflector connectors. 4,257,404, Cl. 126-451.000.
Steinberg, Julius M.: *See—*
Cone, Charles N.; and Steinberg, Julius M., 4,258,088, Cl. 427-316.000.
Steingroever, Erich A. Electrical impulse generator. 4,258,405, Cl. 361-156.000.
Steinrucken, John D. Solar evaporator beehive cover. 4,257,133, Cl. 6-1.000.
Stendahl, Gunnar, to Stal-Laval Apparat AB. Gaseous media heat exchanger. 4,257,478, Cl. 165-104.00F.
Stenfors, Alan: *See—*
Yonkers, Edward H.; Stenfors, Alan; and Mathus, Gregory, 4,257,524, Cl. 211-71.000.
Stephens, Frank M., Jr., to Hazen Research, Inc. Process for enhancing the fuel value of low BTU gas. 4,257,781, Cl. 48-197.00R.
Stephens, Richard E. Wheelchair tie-down. 4,257,644, Cl. 296-65.00R.
Sterling Drug Inc.: *See—*
Mooradian, Aram, 4,257,952, Cl. 260-315.000.
Schmidt, Paul J.; and Hung, William M., 4,257,954, Cl. 260-326.12R.

Sterling, Larry P. Combination clamping and spreading tool. 4,257,584, Cl. 269-88.000.

Sterling, Vaughn C.: *See—*
Hanson, James M.; Pinkasovich, Juliana; and Sterling, Vaughn C., 4,258,412, Cl. 362-10.000.

Stewart, Arnold: *See—*
Belfer, Kenneth H.; Stewart, Arnold; and Tavare, Russell, 4,258,348, Cl. 336-73.000.

Stewart, William R., to Victor United, Inc. Archery bow with thumb receiving opening. 4,257,385, Cl. 124-24.00R.

Stock, Arthur J.; and Christofer, Donald E., to Stock Equipment Company. Feeder for particulate material. 4,257,518, Cl. 198-504.000.

Stock Equipment Company: *See—*
Stock, Arthur J.; and Christofer, Donald E., 4,257,518, Cl. 198-504.000.

Stock, William H., to Rockwell International Corporation. Ejector device for stores. 4,257,639, Cl. 294-83.00R.

Stodt, Enno, to Voith Getriebe KG. Power take-off gearing for operating separate drives, for use for the propellers of an amphibious vehicle, or the like. 4,257,505, Cl. 192-18.00A.

Stoll, Dieter; and Kunz, Oswald, to Ludwig Scheid GmbH Spezialpraparate und Gewurze zur Fleischverarbeitung. Method for introducing a pulverulent material into meat or the like. 4,258,067, Cl. 426-281.000.

Stone & Webster Engineering Corp.: *See—*
Johnson, William B.; and Norton, Richard C., 4,257,171, Cl. 34-57.00A.

Stopinc Aktiengesellschaft: *See—*
Muschner, Udo; and Schnurrenberger, Emil, 4,257,543, Cl. 222-600.000.

Storandt, Duane L. Fire starter unit. 4,257,387, Cl. 126-25.00B.

Stork Friesland B.V.: *See—*
Eversdijk, Bastiaan P.; and Kamphuts, Gerrit G., 4,257,785, Cl. 55-89.000.

Stott, James B.: *See—*
Schuurman, Hubert G.; Stott, James B.; and Gilmour, Ian A., 4,257,760, Cl. 431-158.000.

Stoveken, F. Raymond, to Marcal Paper Mills, Inc. Apparatus for severing sheet material. 4,257,294, Cl. 83-374.000.

Strauss, Bernard: *See—*
Weisman, Irving H.; Strauss, Bernard; George, David; and Wakeley, Harold, 4,258,388, Cl. 358-100.000.

Straznicky, Joseph; and Kumjian, Alexander A., to Hughes Aircraft Company. Universal register. 4,258,273, Cl. 307-221.00R.

Streichenberger, Antonius: *See—*
Streichenberger, Rodolphe H., 4,257,350, Cl. 119-3.000.

Streichenberger, Rodolphe H., to Devin, Francis; Lemarchand, Camille; and Streichenberger, Antonius. Method and device for practicing marine aquaculture. 4,257,350, Cl. 119-3.000.

Strem, Richie C.: *See—*
Strem, Robert C.; Strem, Richie C.; and Eberle, John H., 4,257,366, Cl. 123-554.000.

Strem, Robert C.; Strem, Richie C.; and Eberle, John H., to Omnewtronics, Inc. Fuel feed system and method for gasoline burning internal combustion engine. 4,257,366, Cl. 123-554.000.

Strohm, Elwood: *See—*
Gamm, Paul B.; and Strohm, Elwood, 4,257,414, Cl. 128-160.000.

Strong, Jerry G., to Mobil Oil Corporation. Unsymmetrical thiophosphonate insecticides and nematocides. 4,258,038, Cl. 424-222.000.

Strongin, Grigory M.: *See—*
Berlin, Alfred A.; Kefeli, Tamara Y.; Varlamova, Nina V.; Strongin, Grigory M.; Altshuler, Judif M.; Kolomazov, Boris I.; and Efimov, Alexei V., 4,258,164, Cl. 526-301.000.

Stubbings, James H., to Potomac Applied Mechanics, Inc. Fastening using air hammer. 4,257,548, Cl. 227-8.000.

Stukalenko, Anatoly K.: *See—*
Shirokov, Vasily I.; Maljutin, Gennady G.; Mishiev, Ilyasaf I.; Koshkin, Nikolai N.; Abdullaeva, Farida S.; Stukalenko, Anatoly K.; Novichkov, Alexandr N.; and Saveliev, Jury V., 4,257,794, Cl. 62-28.000.

Stutzman, Douglas D.: *See—*
Eiker, Walter M., Jr.; and Stutzman, Douglas D., 4,257,216, Cl. 56-14.600.

Suess, Peter: *See—*
Wober, Wolfram; Franzius, Dirk; Andersson, Gerd; Jung, Klaus; Suess, Peter; and Wagner, Claus, 4,257,889, Cl. 210-104.000.

Suga, Yoshinori: *See—*
Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; Kitada, Hisashi; and Uehara, Yumito, 4,258,161, Cl. 526-153.000.

Sugano, Kazuhiko: *See—*
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,257,441, Cl. 137-116.300.

Sugier, Andre; Courty, Philippe; and Freund, Edouard, to Societe Francaise des Produits pour Catalyse. Catalyst containing a noble metal of the VIIIth group, copper oxide, zinc oxide and a rare earth metal, its manufacture and use in the conversion of carbon monoxide. 4,257,920, Cl. 252-462.000.

Sugimoto, Mamoru: *See—*
Fujii, Setsuro; Sugimoto, Mamoru; and Yaegashi, Takashi, 4,257,940, Cl. 260-112.50R.

Sullivan, James L.; and Ryan, David S., to Ruiz, Javier R. Portable home gymnasium. 4,257,590, Cl. 272-117.000.

Sulzer Brothers Limited: *See—*
Brunner, Alfred, 4,257,500, Cl. 192-35.000.
Konig, Ferdinand, 4,258,347, Cl. 335-282.000.

Sumi, Masahiko, to Tokyo Shibaura Electric Company, Limited. Electron beam exposing apparatus. 4,258,265, Cl. 250-492.00A.

Sumitomo Bakelite Company, LImited: *See—*
Emura, Tomoyuki; and Moriuchi, Yasuhiro, 4,258,165, Cl. 526-321.000.
Emura, Tomoyuki; and Moriuchi, Yasuhiro, 4,258,165, Cl. 526-321.000.

Sumitomo Chemical Company, Limited: *See—*
Matsuyama, Kiyoshi; Ishikawa, Shozi; Hirata, Seizi; and Ogura, Tsutomu, 4,257,533, Cl. 222-1.000.
Nishimura, Nobuzi; Tsuji, Masayuki; Konishi, Seizo; Yamamoto, Tadashi; Tokieda, Takemi; Sawa, Utazi; and Koumura, Suketsugu, 4,257,770, Cl. 8-549.000.
Tanimura, Shozo; Saito, Yasuhisa; Horiuchi, Hiroshi; Mieno, Kazunori; Nakao, Shinji; Nakano, Takaaki; and Kamei, Kenzo, 4,257,926, Cl. 260-3.000.

Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See—*
Furukawa, Yasuyuki; Fujii, Yoshihisa; Tanaka, Hitoshi; and Hirota, Tetsuya, 4,258,318, Cl. 324-220.000.

Sumitomo Naugatuck Co., Ltd.: *See—*
Sekiguchi, Sadao; Matsumoto, Kojiro; Ishikawa, Tetsuo; Mishiba, Saburo; and Izaki, Nobujiro, 4,257,935, Cl. 260-29.70H.

Sumner, Lee E., Jr.: *See—*
Kountz, Kenneth J.; Cooper, Kenneth W.; Abendschein, Frederic H.; and Sumner, Lee E., Jr., 4,257,238, Cl. 62-176.00B.

Sun Electric Europe B.V.: *See—*
Bovenlander, Johannes P., 4,257,258, Cl. 73-23.000.

Sunburst Solar Energy Corp.: *See—*
Newton, T. Lawrence, 4,257,479, Cl. 165-156.000.

Sung, Rodney L.; Cullen, William P.; and Dorn, Peter, to Texaco Inc. Hydrocarbylsuccinic anhydride and aminotriazole reaction product additive for fuel and mineral oils. 4,257,779, Cl. 44-63.000.

Sung, Rodney L.; and Dorn, Peter, to Texaco Inc. Fuel compositions containing oxazolonium hydroxides. 4,257,780, Cl. 44-63.000.

Sunvic Regler GmbH: *See—*
Dombrowski, Ferdinand; and Forster, Dieter, 4,258,238, Cl. 200-84.00C.

Superior Oil Company, The: *See—*
Fishback, J. William; and Petticrew, Dennis E., 4,257,878, Cl. 209-2.000.

Surface Technology: *See—*
Feldstein, Nathan, 4,258,087, Cl. 427-305.000.

Surprenant, Ronald J.: *See—*
Lenz, Vernon C.; Draeger, William H.; and Surprenant, Ronald J., 4,258,231, Cl. 179-18.0FC.

Sutter, Peter: *See—*
Weis, Claus D.; and Sutter, Peter, 4,258,194, Cl. 546-345.000.

Suzuki, Takaharu; and Shimizu, Hiroshi, to Citizen Watch Co., Ltd. Liquid crystal color display cell. 4,257,682, Cl. 350-349.000.

Suzuki, Yoshiaki: *See—*
Ikenoue, Shinpei; Suzuki, Yoshiaki; and Masuda, Takao, 4,258,129, Cl. 430-620.000.

Svidler, Jury R.: *See—*
Kudryavtsev, Boris B.; Krasnokutsky, Valentin P.; Fedotov, Lev A.; Sholk, Semen F.; Svidler, Jury R.; Zhigarev, Ivan V.; Begunov, Nikolai N.; Kostylev, Valentin F.; Brodsky, Jury M.; and Knyazev, Vadim A., 4,257,888, Cl. 210-97.000.

Svoboda, Vaclav: *See—*
Hiller, Heinz; Schlauer, Johann; Doerges, Alexander; Kempf, Georg; Svoboda, Vaclav; and Zeschmar, Winfried, 4,258,019, Cl. 423-223.000.

Swain, Keith: *See—*
Carroll, John; Dearing, Harry; Swain, Keith; and Naughton, Warren, 4,257,168, Cl. 34-17.000.

Sydendal, Ben I., to Tridon Limited. Band clamp device. 4,257,149, Cl. 24-274.00R.

Synan, Albert M. Andiron and heat distribution unit. 4,257,390, Cl. 126-121.000.

Syrier, Johannes L. M., to Shell Oil Company. Oxabicycloalkane pyrethroid intermediates. 4,257,956, Cl. 260-343.210.

Szabo, Tibor; Institoris, Laszlo; Kovacs, Gabor; Dalmadi, Gyula; Koszegi, Bela; and Stadler, Istvan, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Derivatives of bicyclic lactols. 4,257,962, Cl. 260-346.220.

Szczesuil, Stephen P.: *See—*
Kaupin, William B.; and Szczesuil, Stephen P., 4,257,127, Cl. 2-75.000.

Tachikawa, Hiromichi: *See—*
Uchida, Toshio; Yabuta, Yorimiti; Tachikawa, Hiromichi; and Ikeda, Teppei, 4,258,122, Cl. 430-253.000.

Tagashira, Hiroshi, to Nittan Company, Limited. Optical smoke detector. 4,258,360, Cl. 340-630.000.

Tagawa, Yasuo: *See—*
Kondo, Takashi; Tagawa, Yasuo; Mizuno, Kiyohiko; and Tsuboi, Nobutoshi, 4,257,458, Cl. 137-855.000.

Taggi, Arthur J., to Du Pont de Nemours, E. I., and Company. Preparation of acridinones. 4,258,190, Cl. 546-103.000.

Tajiri, Shinji: *See—*
Yoshida, Tetsuo; Ogura, Toshiyuki; Tajiri, Shinji; and Sata, Toshio, 4,257,317, Cl. 93-40.000.

Takada, Juichiro. Input coupling to a motion amplifier for use in door-actuated seat belt systems. 4,257,625, Cl. 280-804.000.

Takagahara, Isamu; Yamauti, Juniti; Yoshimura, Setsuko; Fujii, Katsumi; and Horio, Takekazu, to Oriental Yeast Co. Ltd. Method of fractional quantitative determination of isoenzyme of lactic dehydrogenase. 4,258,131, Cl. 435-26.000.

Takagi, Tosio. Hose coupling for a faucet. 4,257,449, Cl. 137-505.250.

Takahashi, Kotei: *See—*
Hiraiwa, Kazuyoshi; and Takahashi, Kotei, 4,257,509, Cl. 192-86.000.

Takahashi, Tsuguo: *See—*
Shimada, Katsuhiko; Komine, Isamu; Tanabe, Hideya; Tsunozaki, Shuichi; Yamada, Masayoshi; and Takahashi, Tsuguo, 4,258,319, Cl. 324-226.000.

Takase, Tsutomu: *See—*
Kato, Nobukatsu; Takase, Tsutomu; and Morimoto, Yoshio, 4,258,219, Cl. 568-771.000.

Takasu, Yoshio; and Hino, Takashi, to Canon Kabushiki Kaisha. Process for developing electrostatic latent images. 4,258,116, Cl. 430-102.000.

Takasugi, Wasao: *See—*
Kaneko, Kenji; Okabe, Takahiro; Nakamura, Tohru; Takasugi, Wasao; and Nagata, Minoru, 4,258,330, Cl. 330-257.000.

Takechi, Sadatoshi: *See—*
Kuwagaki, Hiroshi; Hamada, Hiroshi; Takechi, Sadatoshi; and Yano, Kohzo, 4,257,683, Cl. 350-357.000.

Takeda Chemical Industries, Ltd.: *See—*
Ikeda, Yorifumi; Nakatani, Akira; and Tsujimoto, Yasuhiro, 4,257,896, Cl. 210-268.000.
Marumoto, Ryuji; Tanabe, Masao; and Furukawa, Yoshiyasu, 4,258,033, Cl. 424-180.000.

Takeda, Masashi; Hoshimi, Susumu; and Sato, Toshio, to Sony Corporation. Apparatus for controlling the speed and direction of rotation of a DC motor. 4,258,299, Cl. 318-258.000.

Takeda, Yuji: *See—*
Sawada, Daisaku; Shigematu, Takashi; and Takeda, Yuji, 4,257,364, Cl. 123-425.000.

Takegoshi Industry: *See—*
Takegoshi, Katsuki; and Ono, Kiyomi, 4,257,144, Cl. 17-30.000.

Takegoshi, Katsuki; and Ono, Kiyomi, to Takegoshi Industry; and Ohyodo Kinzoku Kogyo. Meat tapper. 4,257,144, Cl. 17-30.000.

Takei, Hirofumi: *See—*
Abe, Eiichi; Ogawa, Naoki; Kubozuka, Takao; and Takei, Hirofumi, 4,257,369, Cl. 123-198.00E.

Takenaka, Yoshimichi: *See—*
Fujita, Isao; Onoda, Mamoru; Kawaguchi, Fumikazu; Takenaka, Yoshimichi; and Tsutaya, Tadao, 4,257,806, Cl. 75-3.000.

Takimoto, Hiroyuki: *See—*
Hirata, Noritsugu; and Takimoto, Hiroyuki, 4,257,693, Cl. 352-209.000.

Takiron Co., Ltd.: *See—*
Iida, Kosuke; Morikawa, Tadayuki; Aoki, Mitsuo; Ueda, Isamu; Butsuda, Takashi; and Tsuda, Osami, 4,257,834, Cl. 156-73.600.

Tamamura, Hideo: *See—*
Yokota, Hideo; and Tamamura, Hideo, 4,257,704, Cl. 356-8.000.

Tamao, Yoshikuni: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,258,192, Cl. 546-166.000.

Tamsky, Morgan J.: *See—*
Larson, Roger L.; and Tamsky, Morgan J., 4,258,095, Cl. 428-172.000.

Tanabe, Hideya: *See—*
Shimada, Katsuhiko; Komine, Isamu; Tanabe, Hideya; Tsunozaki, Shuichi; Yamada, Masayoshi; and Takahashi, Tsuguo, 4,258,319, Cl. 324-226.000.

Tanabe, Masao: *See—*
Marumoto, Ryuji; Tanabe, Masao; and Furukawa, Yoshiyasu, 4,258,033, Cl. 424-180.000.

Tanaka, Akio; Nakajima, Yoshihisa; and Yokomori, Shinji, to Fuji Electric Co., Ltd. Mischief preventing device for a coin sorting machine. 4,257,435, Cl. 133-3.00R.

Tanaka, Hideshi, to Victor Company of Japan, Ltd. Video signal processing circuit. 4,258,390, Cl. 358-160.000.

Tanaka, Hitoshi: *See—*
Furukawa, Yasuyuki; Fujii, Yoshihisa; Tanaka, Hitoshi; and Hirota, Tetsuya, 4,258,318, Cl. 324-220.000.

Tanaka, Toshiaki: *See—*
Etoh, Yukihiro; Tanaka, Toshiaki; and Kunii, Kazuya, 4,257,372, Cl. 123-198.00F.

Tanaka, Yukiyasu: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,257,365, Cl. 123-51.00B.

Taneda, Kozo: *See—*
Sogo, Yukio; Ido, Kazuo; Taneda, Kozo; Sakai, Katzuji; and Sato, Yoichiro, 4,257,786, Cl. 55-261.000.

Tanimura, Shozo; Saito, Yasuhisa; Horiuchi, Hiroshi; Mieno, Kazunori; Nakao, Shinji; Nakano, Takaaki; and Kamei, Kenzo, to Sumitomo Chemical Company, Limited. Adhesion of rubber to reinforcing materials. 4,257,926, Cl. 260-3.000.

Tanner, Heinrich, to Concast Incorporated. Continuous casting of hollow shapes. 4,257,472, Cl. 164-70.000.

Task, Harry L.; and Gafvert, Ross J., to United States of America, Air Force. Optical protractor. 4,257,164, Cl. 33-1.00N.

Tatami, Mitsushige, to Sony Corporation. Color video signal processing system. 4,258,384, Cl. 358-16.000.

Tavare, Russell: *See—*
Belfer, Kenneth H.; Stewart, Arnold; and Tavare, Russell, 4,258,348, Cl. 336-73.000.

Tax, Hans; Hosler, Klaus; and Bauer, Dieter, to Tax, Hans. Terrain-adaptable support structure. 4,257,618, Cl. 280-6.110.

Taylor, Christine S. Auxiliary dispensing device for air treatment. 4,257,787, Cl. 55-279.000.

Taylor, Donald M.: *See—*
Leblanc, Raymond F.; Taylor, Donald M.; and Hartney, Robert W., 4,257,994, Cl. 264-102.000.

Taylor, Peter J.: *See—*
Hunt, Kevin W.; and Taylor, Peter J., 4,257,719, Cl. 405-173.000.

Taylor, Ralph: *See—*
Barnsley, Michael P.; Eccles, Edward S.; and Taylor, Ralph, 4,257,311, Cl. 91-363.00A.

TDK Electronics Co., Ltd.: *See—*
Nishikawa, Kyoichi, 4,257,989, Cl. 261-4.000.

Technical Wire Products, Inc.: *See—*
Dalamangas, Chris A.; and Piccirillo, Thomas P., 4,257,661, Cl. 339-75.0MP.

Technicon Instruments Corp.: *See—*
Ornstein, Leonard; Williams, Hazel E.; and Intraub, Julius, 4,257,346, Cl. 118-641.000.

Teledyne Industries, Inc.: *See—*
Adamus, Ronald A.; and Heiser, Arlan H., 4,257,254, Cl. 72-432.000.
Leblanc, Raymond F.; Taylor, Donald M.; and Hartney, Robert W., 4,257,994, Cl. 264-102.000.
Neel, Robert M., 4,257,555, Cl. 236-94.000.

Tenneco Chemicals, Inc.: *See—*
Feldman, Martin L.; and De Groff, James T., 4,257,930, Cl. 260-40.00R.
Fischer, Alfred, 4,257,913, Cl. 252-356.000.

Terayama, Takao: *See—*
Iijima, Kazunori; Honma, Kazuo; Terayama, Takao; Yoshida, Masashi; Kawase, Hideyuki; and Miyakawa, Seii, 4,258,399, Cl. 360-85.000.

Terayama, Toshiki, to Olympus Optical Co., Ltd. Ring applicator with an endoscope. 4,257,420, Cl. 128-303.00A.

Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,257,978, Cl. 260-544.00L.

Tetenborg, Konrad; and Huwelmann, Helmut, to Windmoller & Holscher. Apparatus for gathering the flattened filling ends of filled large sacks by means of zig-zag folding. 4,257,209, Cl. 53-371.000.

Tetenborg, Konrad; and Huwelmann, Helmut, to Windmoller & Holscher. Apparatus for laterally turning over the flattened filling end of filled large sacks for preparing the sack closure. 4,257,210, Cl. 53-371.000.

Teufel, Hermann: *See—*
Bartmann, Wilhelm; Beck, Gerhard; Reuschling, Dieter-Bernd; Seeger, Karl; and Teufel, Hermann, 4,258,053, Cl. 424-275.000.

Teutsch, Jean G.: *See—*
Costerousse, Germain; and Teutsch, Jean G., 4,257,948, Cl. 260-239.55R.

Texaco Inc.: *See—*
Crone, John M., Jr., 4,257,225, Cl. 60-274.000.
Powell, Justin C., 4,257,958, Cl. 260-346.700.
Sung, Rodney L.; Cullen, William P.; and Dorn, Peter, 4,257,779, Cl. 44-63.000.
Sung, Rodney L.; and Dorn, Peter, 4,257,780, Cl. 44-63.000.

Texas Instruments Incorporated: *See—*
Matalone, Samuel, Jr., 4,257,826, Cl. 148-1.500.
Raymond, Joseph H., Jr., 4,258,429, Cl. 364-900.000.
Wall, Lawrence S., 4,258,378, Cl. 357-41.000.

Texidor, Julio; Krause, Arthur M.; and Texidor, Patricio. Humidifier. 4,257,389, Cl. 126-113.000.

Texidor, Patricio: *See—*
Texidor, Julio; Krause, Arthur M.; and Texidor, Patricio, 4,257,389, Cl. 126-113.000.

Textron, Inc.: *See—*
Covington, Cecil E.; Snyder, David E.; Sonneborn, Walter G.; and Cresap, Wesley L., 4,257,739, Cl. 416-134.00A.

Tezuka, Tohru: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,258,192, Cl. 546-166.000.

Tharrington, George, Jr.: *See—*
Ashton, David H.; and Tharrington, George, Jr., 4,258,130, Cl. 435-7.000.

Therm-O-Disc, Incorporated: *See—*
Richardson, Steven R., 4,258,325, Cl. 324-417.000.

Thermo King Corporation: *See—*
Christiansen, David A.; Kiefer, Kevin W.; Naley, Lowell B.; Seipp, Ronald W.; Shirek, Lawrence J.; and Harrington, Robert L., 4,257,240, Cl. 62-448.000.

Theurer, Josef; and Oellerer, Friedrich, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Track surfacing machine. 4,257,331, Cl. 104-2.000.

Thiel, Max: *See—*
Witte, Ernst-Christian; Wolff, Hans P.; Thiel, Max; Stegmeier, Karlheinz; and Roesch, Egon, 4,258,058, Cl. 424-309.000.

Thiel, Robert C. Silicon carbide furnace side frames. 4,257,337, Cl. 110-336.000.

Thom, Joseph R. Variable-ballast chumming lure. 4,257,182, Cl. 43-42.060.

Thoma, Richard: *See—*
Horn, Peter; Grosskinsky, Otto-Alfred; Thoma, Richard; and Fuchs, Hugo, 4,257,950, Cl. 260-239.30A.

Thomas, William O.; and Hill, Robin, to Goricon Metallurgical Services Limited. Refractory materials. 4,257,990, Cl. 264-36.000.

Thomasma, William S.; and Wilson, John F. Fluid heating system utilizing solid fuel. 4,257,557, Cl. 237-19.000.
Thompson, Gregory J.: *See—*
Lengemann, Robert A.; Thompson, Gregory J.; and Vickers, Anthony G., 4,257,875, Cl. 208-113.000.
Thompson, Mortimer S. Bottle with attached handle. 4,257,525, Cl. 215-100.00A.
Thompson, Raymond J. T., to BSR Limited. Record players. 4,257,614, Cl. 369-267.000.
Thomson-CSF: *See—*
Beguin, Alain; Zann, Annie; and Dubois, Jean-Claude, 4,257,910, Cl. 252-299.000.
Thorneburg, James L. Hosiery display hanger package. 4,257,522, Cl. 206-299.000.
Thornhill, Dewey B.: *See—*
Roder, Hugh H.; Denningmann, Elroy; and Thornhill, Dewey B., 4,257,316, Cl. 493-68.000.
Thorstensson, Gustav Y.: *See—*
Tisell, Claes-Gustav E. Y.; Lundell, Karl E. B.; Horner, Sven H. N.; Thorstensson, Gustav Y.; and Karlstedt, Gustav S. E., 4,257,315, Cl. 92-26.000.
Thru-Vu Vertical Blind Corp.: *See—*
Woodle, Allan S., 4,257,470, Cl. 160-172.000.
Thur, Gerry W.; and Moore, Timothy A., to Baltimore Aircoil Co. Automatic control system for centrifugal pumps. 4,257,745, Cl. 417-18.000.
Thurmond, Elmer T., Jr., to Equipment Company of America. Strip curtain door. 4,257,471, Cl. 160-332.000.
Thyssengas GmbH: *See—*
Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, 4,258,006, Cl. 422-146.000.
Tietze, Thomas N.: *See—*
Andrews, Larry A.; and Tietze, Thomas N., 4,258,323, Cl. 324-348.000.
Tisell, Claes-Gustav E. Y.; Lundell, Karl E. B.; Horner, Sven H. N.; Thorstensson, Gustav Y.; and Karlstedt, Gustav S. E., to Forenade Fabriksverken. Assembly with relatively displaceable members. 4,257,315, Cl. 92-26.000.
Toa Harbor Works Co., Ltd.: *See—*
Nakajima, Hisaharu, 4,257,722, Cl. 405-248.000.
Todd, William H., Jr.: *See—*
Arnoldi, Douglas R.; and Todd, William H., Jr., 4,258,373, Cl. 346-154.000.
Toelke, Lester; and Kimmel, J. D., to Well Control, Inc. Compression shock absorber device. 4,257,245, Cl. 64-23.000.
Tokairin, Toshio: *See—*
Murakami, Tadashi; Yamane, Mamoru; Tokairin, Toshio; and Kawai, Kenji, 4,257,778, Cl. 44-1.00R.
Tokieda, Takemi: *See—*
Nishimura, Nobuzi; Tsuji, Masayuki; Konishi, Seizo; Yamamoto, Tadashi; Tokieda, Takemi; Sawa, Utazi; and Koumura, Suketsugu, 4,257,770, Cl. 8-549.000.
Toko, Inc.: *See—*
Miyajima, Hajime; and Nakakura, Akio, 4,258,342, Cl. 333-151.000.
Tokuda, Kazuo; Watanabe, Hidetaro; and Shimizu, Yoshikazu, to Nippon Electric Co., Ltd. Constant voltage generator for generating a constant voltage having a predetermined temperature coefficient. 4,258,311, Cl. 323-313.000.
Tokumo, Akio, to Pioneer Electronic Corporation. Noise suppression system. 4,258,329, Cl. 330-149.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Fujii, Michinobu, 4,257,743, Cl. 416-196.00R.
Fukuda, Norisuke, 4,257,708, Cl. 356-435.000.
Nagashima, Yoshitake; Noyori, Kazumasa; and Moriyama, Hideki, 4,258,274, Cl. 307-254.000.
Ogata, Hisao; and Fujii, Michinobu, 4,257,742, Cl. 416-190.000.
Yoshikawa, Noriaki, 4,257,256, Cl. 73-626.000.
Tokyo Shibaura Electric Company, Limited: *See—*
Sumi, Masahiko, 4,258,265, Cl. 250-492.00A.
Tolle, Hans: *See—*
Walther, Carl K.; and Tolle, Hans, 4,257,196, Cl. 51-163.200.
Tollett, James T.; and Fletcher, Donald R., to Dow Chemical Company, The. Feed composition containing ronnel and antibiotic A3823 complex and use thereof. 4,258,031, Cl. 424-115.000.
Tomalia, Donald A., to Dow Chemical Company, The. Novel sulfonyl imide intermediates. 4,257,970, Cl. 260-401.000.
Tomson, Steven H. Bubble producing, preserving and display apparatus. 4,257,185, Cl. 46-6.000.
Tomy Kogyo Co., Inc.: *See—*
Kurita, Toshiaki, 4,257,601, Cl. 273-115.000.
Tone Commander Systems, Inc.: *See—*
Smith, Maurice I.; and Gillen, John D., 4,258,232, Cl. 179-99.00R.
Tonomura, Shinji: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,258,192, Cl. 546-166.000.
Topsil A/S: *See—*
De Leon, Noel; Larsen, Arno I. M.; Knudsen, Poul E.; and Jensen, Erik H., 4,258,009, Cl. 422-250.000.
Toray Industries, Inc.: *See—*
Hosoi, Kazuo; and Ozawa, Hitoshi, 4,257,938, Cl. 260-112.00R.
Kajimoto, Tsunesuke, 4,257,967, Cl. 260-348.340.
Yomamoto, Yoshiyuki; Yoshioka, Akira; and Morikawa, Masanobu, 4,258,153, Cl. 525-397.000.
Torchilin, Vladimir P.: *See—*
Berezin, Ilia V.; Goldmakher, Viktor S.; Klibanov, Alexandr M.; Martinek, Karel; Mishin, Alexandr A.; Samokhin, Gennady P.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; and Chazov, Evgeny I., 4,257,269, Cl. 73-606.000.
Torelli, Vesperto: *See—*
Nedelec, Lucien; Torelli, Vesperto; Fournex, Robert; and Tournemine, Colette, 4,258,039, Cl. 424-241.000.
Torii & Co., Ltd.: *See—*
Fujii, Setsuro; Sugimoto, Mamoru; and Yaegashi, Takashi, 4,257,940, Cl. 260-112.50R.
Tornkvist, Rolf E. A., to Salen Energy AB. Marine wave power plant. 4,258,270, Cl. 290-53.000.
Toro Company, The: *See—*
Hunter, Edwin J., 4,257,440, Cl. 137-99.000.
Torok, Vilmos, to ASEA Aktiebolag. Apparatus for supplying current of changing polarity to a load object. 4,258,415, Cl. 363-64.000.
Toth, Janos: *See—*
Mariasi, Bela; Molnar, Laszlo; Toth, Janos; Gulya, Imre; Nagy, Miklos; Wolfram, Ervin; Zrinyi, Miklos; Kovacs, Gaborne; and Jaksity, Laszlone, 4,258,163, Cl. 526-202.000.
Toukan, Sameeh S., to Pennwalt Corporation. Manufacture of sulfenamides. 4,258,197, Cl. 548-167.000.
Tournemine, Colette: *See—*
Nedelec, Lucien; Torelli, Vesperto; Fournex, Robert; and Tournemine, Colette, 4,258,039, Cl. 424-241.000.
Tournier, Herve: *See—*
Regnault, Alain; Sachetto, Jean-Pierre; Tournier, Herve; Hamm, Thomas; and Armanet, Jean-Michel, 4,257,818, Cl. 127-1.000.
Townsend, Newton A., to Olympic Infra-Dry Inc. Combination forced air and infrared dryer. 4,257,172, Cl. 34-68.000.
Toyo Jozo Kabushiki Kaisha: *See—*
Fujii, Tadashiro; Nakagawa, Nobuaki; and Kotani, Kikuo, 4,258,193, Cl. 546-281.000.
Toyo Rubber Industry Co., Ltd., The: *See—*
Uemura, Yukihisa, 4,257,469, Cl. 152-356.00R.
Toyoda Jidosha Kogyo Kabushiki Kaisha: *See—*
Kawase, Mitsuo; and Watanabe, Hiroyuki, 4,257,623, Cl. 280-660.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ishida, Yasuhiko, 4,257,371, Cl. 123-198.00F.
Kondo, Takashi; Tagawa, Yasuo; Mizuno, Kiyohiko; and Tsuboi, Nobutoshi, 4,257,458, Cl. 137-855.000.
Matsui, Takeshi; Kohama, Tokio; Kawai, Hisasi; Nishimatsu, Akira; Ina, Toshikazu; Nohira, Hidetaka; and Kobashi, Kiyoshi, 4,257,382, Cl. 123-571.000.
Morishita, Teru; and Kazaoka, Manabu, 4,257,235, Cl. 60-736.000.
Morishita, Teru, 4,257,236, Cl. 60-745.000.
Nogami, Tomoyuki, 4,257,498, Cl. 188-218.00A.
Nogami, Tomoyuki, 4,257,498, Cl. 188-218.00A.
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,257,365, Cl. 123-51.00B.
Sakamaki, Hiroshi; Maeda, Yoshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, 4,257,753, Cl. 418-133.000.
Sawada, Daisaku; Shigematu, Takashi; and Takeda, Yuji, 4,257,364, Cl. 123-425.000.
Transamerica DeLaval Inc.: *See—*
Ogle, Francis H., Jr.; and Koppl, Ernest R., 4,257,444, Cl. 137-315.000.
Trassl, Werner; Purr, Gerhard; and Scheffczyk, Helmut, to Kraftwerk Union Aktiengesellschaft. Valve arrangement for turbosets. 4,257,234, Cl. 60-719.000.
Trautmann, Walter: *See—*
Fischer, Martin; Kuesters, Werner; Penzel, Erich; Rehder, Wolfgang; and Trautmann, Walter, 4,257,859, Cl. 204-159.230.
Traver, Frank J.; and Raleigh, William J., to General Electric Company. Silicone compositions for treating gypsum board. 4,258,102, Cl. 428-331.000.
Trecek, James B.; and Wiesner, George L., to American Cyanamid Company. Vapor phase oxidation process for glyoxal. 4,258,216, Cl. 568-473.000.
Treijner, Hakan: *See—*
Gestblom, Barbro; Martinsson, Christer; and Treijner, Hakan, 4,257,170, Cl. 34-48.000.
Tridon Limited: *See—*
Kassfeldt, Hillar, 4,258,292, Cl. 315-200.00A.
Sydendal, Ben I., 4,257,149, Cl. 24-274.00R.
Tringham, Roger W.: *See—*
Green, Kieron P.; Inglis, Bruce R.; Allen, Roger A.; and Tringham, Roger W., 4,257,754, Cl. 425-84.000.
Triplett, Kelly B.: *See—*
Gansow, Otto A.; and Triplett, Kelly B., 4,257,955, Cl. 260-338.000.
Tromp, Gerardus M. Device to apply a paper sheet to a closet seat. 4,257,131, Cl. 4-246.000.
TRW Inc.: *See—*
Kelly, Franklin G.; Bashin, Saul; and Kennedy, Robert E., 4,257,821, Cl. 136-244.000.
Tryson, Kathie J.: *See—*
Langguth, Robert P.; and Tryson, Kathie J., 4,257,907, Cl. 252-106.000.
Tsai, Yih-Wan, to PPG Industries, Inc. Manifold regeneration flues for regenerative furnaces. 4,257,476, Cl. 165-9.300.
Tsubaki, Kazumi; Koto, Noriaki; and Maeda, Kouichi, to Nissan Chemical Industries, Ltd. Process for producing powdery isotactic polyolefin. 4,258,167, Cl. 526-128.000.
Tsuboi, Nobutoshi: *See—*
Kondo, Takashi; Tagawa, Yasuo; Mizuno, Kiyohiko; and Tsuboi, Nobutoshi, 4,257,458, Cl. 137-855.000.
Tsubota, Junjiro. Wave power generator. 4,258,269, Cl. 290-53.000.

Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, to Olympus Optical Co., Ltd. Electrophotographic apparatus. 4,257,700, Cl. 355-3.0TR.

Tsuda, Osami: *See*—
Iida, Kosuke; Morikawa, Tadayuki; Aoki, Mitsuo; Ueda, Isamu; Butsuda, Takashi; and Tsuda, Osami, 4,257,834, Cl. 156-73.600.

Tsuge, Ayao: *See*—
Abe, Kenji; Tsuge, Ayao; Hirao, Yasuhiko; Hori, Keiichi; and Isono, Masamichi, 4,257,819, Cl. 134-19.000.

Tsuji, Masayuki: *See*—
Nishimura, Nobuzi; Tsuji, Masayuki; Konishi, Seizo; Yamamoto, Tadashi; Tokieda, Takemi; Sawa, Utazi; and Koumura, Suketsugu, 4,257,770, Cl. 8-549.000.

Tsujimoto, Yasuhiro: *See*—
Ikeda, Yorifumi; Nakatani, Akira; and Tsujimoto, Yasuhiro, 4,257,896, Cl. 210-268.000.

Tsunekawa, Tokuichi: *See*—
Hosoe, Kazuya; Niwa, Yukichi; Tsunekawa, Tokuichi; Owada, Mitsutoshi; Asano, Noriyuki; and Masunaga, Makoto, 4,257,705, Cl. 356-1.000.

Tsunozaki, Shuichi: *See*—
Shimada, Katsuhiko; Komine, Isamu; Tanabe, Hideya; Tsunozaki, Shuichi; Yamada, Masayoshi; and Takahashi, Tsuguo, 4,258,319, Cl. 324-226.000.

Tsuruoka, Takashi: *See*—
Kai, Fumio; Tsuruoka, Takashi; Makabe, Osamu; Inouye, Shigeharu; Ikeda, Hitoshi; Kazuno, Yuzo; Nakajima, Shokichi; Seki, Shigeo; and Niida, Taro, 4,258,184, Cl. 544-27.000.

Tsutaya, Tadao: *See*—
Fujita, Isao; Onoda, Mamoru; Kawaguchi, Fumikazu; Takenaka, Yoshimichi; and Tsutaya, Tadao, 4,257,806, Cl. 75-3.000.

Tsuya, Noboru; and Arai, Kenichi, to Tsuya, Noboru. Method of manufacturing a thin ribbon of magnetic material. 4,257,830, Cl. 148-112.000.

Tucker, Benjamin W.: *See*—
Farrissey, William J., Jr.; McLaughlin, Alexander; Richter, Reinhard H.; Smith, Curtis P.; and Tucker, Benjamin W., 4,257,996, Cl. 264-122.000.

Tuomaala, Jorma, to A. Ahistrom Osakeyhtio. Circular saw blade. 4,257,301, Cl. 83-835.000.

Turner, Ronald L.: *See*—
Kindig, James K.; and Turner, Ronald L., 4,257,881, Cl. 75-1.00R.

Turney, Larry R., to Victor Equipment Company. Check valve. 4,257,443, Cl. 137-269.500.

Twinfold Nominees Pty. Limited: *See*—
Paton, George, 4,257,451, Cl. 137-512.100.

Tyburski, Robert M. Information collection and storage system with removable memory. 4,258,430, Cl. 364-900.000.

Ube Industries Limited: *See*—
Ogawa, Masaki; Araki, Tamio; and Yamamoto, Shinji, 4,257,468, Cl. 152-209.00R.

Uber, Raymond F.: *See*—
Childers, Clifford W.; and Uber, Raymond F., 4,258,144, Cl. 525-91.000.

Uchida, Isamu, to Laurel Bank Machine Co., Ltd. Rod for supporting accumulated coins in coin packaging machine. 4,257,208, Cl. 53-212.000.

Uchida, Toshio; Yabuta, Yorimiti; Tachikawa, Hiromichi; and Ikeda, Teppei, to Fuji Photo Film Co., Ltd. Process for preparing lithographic printing plate using silicate containing-desensitizer. 4,258,122, Cl. 430-253.000.

Ueda, Isamu: *See*—
Iida, Kosuke; Morikawa, Tadayuki; Aoki, Mitsuo; Ueda, Isamu; Butsuda, Takashi; and Tsuda, Osami, 4,257,834, Cl. 156-73.600.

Uehara, Yumito: *See*—
Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; Kitada, Hisashi; and Uehara, Yumito, 4,258,161, Cl. 526-153.000.

Uemura, Yukihisa, to Toyo Rubber Industry Co., Ltd., The. Radial tire having inner and outer carcass layers, cords of outer layer are thinner relative to inner and cover bead filler. 4,257,469, Cl. 152-356.00R.

Uhde GmbH: *See*—
Meurer, Peter; Hater, Martin; Meininghaus, Fritz; and Scheel, Rudiger, 4,257,898, Cl. 210-751.000.

Uhlig, Albert R., to Owens-Illinois, Inc. Child resistant sifter type closure. 4,257,537, Cl. 222-153.000.

Ullman, Michael K.; David, Stephen T.; and Gallian, Claude E., to Mead Johnson & Company. Multi-fractionable tablet structure. 4,258,027, Cl. 424-15.000.

Ulrich, Johann-Georg, to Dr. Ing. H.c.F. Porsch Aktiengesellschaft. Fuel injection system for mixture-compressing internal combustion engines with spark ignition. 4,257,375, Cl. 123-453.000.

UMC Industries, Inc.: *See*—
Smith, Barry L., 4,257,436, Cl. 133-5.00R.

Unicorn Electrical Products: *See*—
Siglock, John V., 4,258,295, Cl. 315-189.000.

Unidynamics/St. Louis, Inc.: *See*—
Beckham, David E., 4,257,493, Cl. 187-20.000.

Union Carbide Corporation: *See*—
Grose, Robert W.; and Flanigen, Edith M., 4,257,885, Cl. 210-691.000.
Karp, Joseph G., 4,257,146, Cl. 17-49.000.
Vidal, Jose L.; and Walker, Wellington E., 4,257,972, Cl. 260-429.00R.
Wheeler, Thomas N., 4,257,858, Cl. 204-158.00R.

Uniroyal AG: *See*—
Van der Burg, Sjirk, 4,257,467, Cl. 152-158.000.

Uniroyal Ltd.: *See*—
MacPherson, Edwin J.; Alderson, Peter J.; and Skinner, Douglas A., 4,257,517, Cl. 198-497.000.

United Kingdom Atomic Energy Authority: *See*—
Pollock, James F.; Linger, Keith R.; and Hewinson, Vincent K., 4,257,157, Cl. 29-611.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Elliott, Charles T., 4,258,254, Cl. 250-211.00J.
Gray, George W.; and McDonnell, Damien G., 4,257,911, Cl. 252-299.000.

United States Gypsum Company: *See*—
Kuhr, Albert F., 4,257,205, Cl. 52-484.000.

United States of America
Air Force: *See*—
Ashbee, Kenneth H. G., 4,257,265, Cl. 73-150.00A.
Task, Harry L.; and Gafvert, Ross J., 4,257,164, Cl. 33-1.00N.
Army: *See*—
Lane, Richard A.; and Fronek, Donald K., 4,258,423, Cl. 364-484.000.
Porter, William L.; and Kramer, Roslyn E., 4,257,776, Cl. 23-230.00M.
Ribaudo, Charles; Leccacorvi, John F.; and Gilbert, Everett E., 4,258,224, Cl. 568-935.000.
Weisman, Irving H.; Strauss, Bernard; George, David; and Wakeley, Harold, 4,258,388, Cl. 358-100.000.
Energy: *See*—
Christophorou, Loucas G.; James, David R.; Pace, Marshall O.; and Pai, Robert Y., 4,257,905, Cl. 252-571.000.
Gibby, Ronald L.; Lawrence, Leo A.; Woodley, Robert E.; Wilson, Charles N.; Weber, Edward T.; and Johnson, Carl E., 4,257,847, Cl. 176-68.000.
Hendricks, Charles D.; Koo, Jackson C.; and Rosencwaig, Allan, 4,257,798, Cl. 65-21.400.
Hendricks, Charles D., 4,258,075, Cl. 427-6.000.
Marling, John B.; and Herman, Irving P., 4,257,860, Cl. 204-163.00R.
Morris, John W., Jr.; and Niikura, Masakazu, 4,257,808, Cl. 75-123.00N.
Rosencwaig, Allen; Koo, Jackson C.; and Dressler, John L., 4,257,799, Cl. 65-21.400.
Zielke, Clyde W.; and Bagshaw, Gary H., 4,257,873, Cl. 208-108.000.
Zielke, Clyde W.; and Rosenhoover, William A., 4,257,914, Cl. 252-415.000.
Health, Education and Welfare: *See*—
Dubicki, Henryk; Parsons, Jack L.; and Starks, Fred W., 4,258,191, Cl. 546-106.000.
Interior: *See*—
Siemens, Richard E.; Nilsen, David; and Rhoads, Stanley C., 4,258,016, Cl. 423-24.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Green, Kenneth A. Multifrequency broadband polarized horn antenna. 4,258,366, Cl. 343-786.000.
Navy: *See*—
Allcock, Harry R.; and Harris, Paul J., 4,258,172, Cl. 528-168.000.
Campbell, Kenneth J., 4,258,436, Cl. 375-10.000.
Fletcher, Paul C.; and Hildebrand, Verne E., 4,258,336, Cl. 331-94.50C.

U.S. Philips Corporation: *See*—
Balzarini, Giovanni; and Papeschi, Roberto, 4,258,426, Cl. 364-518.000.
Bijl, Hendrik A. C.; and Bergsma, Wijtes, 4,257,161, Cl. 30-43.600.
Clasen, Rolf; and Junginger, Hans G., 4,258,114, Cl. 430-67.000.
Daenen, Theo E. G.; Oomen, Johannes M.; and Van de Berg, Joseph F. M., 4,257,854, Cl. 204-36.000.
Demuliere, Pierre; and Heins, Pierre, 4,258,333, Cl. 331-11.000.
Eisemann, Kurt, 4,257,466, Cl. 411-371.000.
Harding, Geoffrey, 4,258,256, Cl. 250-272.000.
Rijckaert, Albert M. A., 4,258,282, Cl. 310-317.000.
Roger, Bernard P., 4,258,380, Cl. 357-51.000.
Schaumburg, Hanno, 4,257,825, Cl. 148-1.500.
Shannon, John M., 4,258,376, Cl. 357-24.000.

United States Steel Corporation: *See*—
Brayton, William E.; Fun, Fay; Hendrickson, Luther G.; and Shoenberger, Ronald W., 4,257,848, Cl. 202-82.000.

United Technologies Corporation: *See*—
Andress, Dale E.; and Clevenger, Douglas H., 4,257,737, Cl. 416-97.00R.
Schwarz, Frederick M., 4,257,222, Cl. 60-39.020.

Unitika Ltd.: *See*—
Kyo, Kayomon; Asahara, Nakaba; Asai, Yasuhiko; Hirose, Isamu; and Kato, Sadao, 4,258,154, Cl. 525-425.000.

University of Alabama, The: *See*—
Pittman, Charles U., Jr.; and Ng, Quock Y., 4,258,206, Cl. 560-233.000.

University of Strathclyde: *See*—
Donaldson, Gordon B., 4,258,251, Cl. 235-92.0AC.

University Patents, Inc.: *See*—
Banks, Allen R.; Fibiger, Richard F.; and Jones, Ted, 4,258,204, Cl. 560-205.000.

Unsted, Lionel P., to Management Operations Limited. Safety footwear. 4,257,177, Cl. 36-77.00R.

UOP Inc.: *See—*
Gelfand, Dennis B., 4,258,017, Cl. 423-210.000.
Ginger, Edward, 4,257,918, Cl. 252-440.000.
Ginger, Edward A., 4,258,020, Cl. 423-239.000.
Lengemann, Robert A.; Thompson, Gregory J.; and Vickers, Anthony G., 4,257,875, Cl. 208-113.000.

Upjohn Company, The: *See—*
Beaton, John M., 4,257,949, Cl. 260-239.55R.
Eiker, Walter M., Jr.; and Stutzman, Douglas D., 4,257,216, Cl. 56-14.600.
Farrissey, William J., Jr.; McLaughlin, Alexander; Richter, Reinhard H.; Smith, Curtis P.; and Tucker, Benjamin W., 4,257,996, Cl. 264-122.000.
McLaughlin, Alexander; Richter, Reinhard H.; and Reymore, Harold E., Jr., 4,257,995, Cl. 264-122.000.
Prather, Richard A.; Williams, David L.; Partin, Robert M.; and Rabourn, Warren J., 4,258,169, Cl. 528-72.000.
Sih, John C., 4,257,963, Cl. 260-346.220.
Sih, John C., 4,257,964, Cl. 260-346.220.
Sih, John C., 4,257,965, Cl. 260-346.220.
Sih, John C., 4,257,971, Cl. 260-404.000.
Sih, John C., 4,257,979, Cl. 564-454.000.
Sih, John C., 4,257,980, Cl. 564-336.000.
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Sih, John C., 4,257,982, Cl. 564-453.000.
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Uraneck, Carl A.; and Burleigh, John E., to Phillips Petroleum Company. Polymers of conjugated dienes which have terminal conjugated unsaturated alicyclic functional groups. 4,258,162, Cl. 526-173.000.

Ushijima, Fumihiro: *See—*
Sakamaki, Hiroshi; Maeda, Yoshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, 4,257,753, Cl. 418-133.000.

Ushio, Akiro: *See—*
Wada, Hideo; Ushio, Akiro; and Koganei, Masaharu, 4,257,828, Cl. 148-6.160.

Usui, Kiyoshi: *See—*
Yukuta, Toshio; Ishiwaka, Takumi; and Usui, Kiyoshi, 4,258,139, Cl. 521-110.000.

USV Pharmaceutical Corporation: *See—*
Auerbach, Joseph; and Kantor, Martin L., 4,258,059, Cl. 424-321.000.
Loev, Bernard; and Shroff, James R., 4,258,042, Cl. 424-248.500.

Vachon, Raymond N.; and Partin, Hazel R. R., to Permabond International Corporation. Polyester adhesives. 4,257,928, Cl. 260-33.40R.

Vahlhaus, Dieter: *See—*
Aller, Walther; Eisermann, Eckehard; Vahlhaus, Dieter; and Konig, Gerd, 4,257,542, Cl. 222-600.000.

Valentin, Guenter: *See—*
Hoerauf, Werner; and Valentin, Guenter, 4,258,178, Cl. 528-502.000.

Valenzona, Joseph F.; and Fenstermaker, Michael, to Orion Industries, Inc. Air freshener. 4,258,004, Cl. 422-123.000.

Van Kooten B.V.: *See—*
Schnell, Hans G., 4,257,488, Cl. 173-133.000.

Van Berkel, Johannes; and Kelderman, Hendrik C., to Shell Oil Company. 2,2-Dimethylcyclopropanecarbaldehyde dimethyl acetal derivatives. 4,258,205, Cl. 560-231.000.

van Brummelen, Johannes, to Moba Holding Barneveld B.V. Device for modelling or packing an object. 4,257,141, Cl. 17-11.000.

Van de Berg, Joseph F. M.: *See—*
Daenen, Theo E. G.; Oomen, Johannes M.; and Van de Berg, Joseph F. M., 4,257,854, Cl. 204-36.000.

Van der Burg, Sjirk, to Uniroyal AG. Run-flat tire. 4,257,467, Cl. 152-158.000.

Vanderhorst, Ed W.; and Vanderhorst, Henry L. Knurling tool. 4,257,250, Cl. 72-108.000.

Vanderhorst, Henry L.: *See—*
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van Dyke, Martin J.: *See—*
Dougherty, William R.; van Dyke, Martin J.; and Colby, Dwight D., 4,258,422, Cl. 364-442.000.

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Van Rooyen, Gerrit: *See—*
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Van Scott, Eugene J.: *See—*
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Varel Manufacturing Company: *See—*
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Varlamova, Nina V.: *See—*
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Varma, Ravi K., to E. R. Squibb & Sons, Inc. 16,17-Dihydroxypregnene-21-carboxylic acids and derivatives. 4,257,969, Cl. 260-397.100.

Varta Batterie, A.G.: *See—*
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Vaughn, George L.; and Hollingsworth, John D., to John D. Hollingsworth on Wheels, Inc. Fiber transfer method. 4,257,148, Cl. 19-98.000.

VEB Polygraph Leipzig, Kombinat fur polygraphische Maschinen und Ausrustungen: *See—*
Johne, Albrecht, 4,258,326, Cl. 328-5.000.
Weisbach, Gunter, 4,257,586, Cl. 271-235.000.

Velsicol Chemical Corporation: *See—*
Chen, Sun-Mao, 4,258,175, Cl. 528-217.000.

Venus Products, Inc.: *See—*
Ives, Frank E.; and Nash, Terrence G. (said Terrace G. Nash, a part interest assors. to), 4,257,748, Cl. 417-63.000.

Veriflo Corporation: *See—*
Ollivier, Louis A., 4,257,450, Cl. 137-505.420.

Ver Mehren, Hubert R., to Ga-Vehren Engineering Company. Conveyor apparatus with alignment means. 4,257,514, Cl. 198-459.000.

Vickers, Anthony G.: *See—*
Lengemann, Robert A.; Thompson, Gregory J.; and Vickers, Anthony G., 4,257,875, Cl. 208-113.000.

Vickers Limited: *See—*
Hunt, Kevin W.; and Taylor, Peter J., 4,257,719, Cl. 405-173.000.

Victor Company of Japan, Limited: *See—*
Kitamura, Masatsugu; Onoye, Hideo; and Yamazaki, Masami, 4,258,397, Cl. 360-31.000.
Tanaka, Hideshi, 4,258,390, Cl. 358-160.000.

Victor Equipment Company: *See—*
Turney, Larry R., 4,257,443, Cl. 137-269.500.

Victor United, Inc.: *See—*
Stewart, William R., 4,257,385, Cl. 124-24.00R.

Vidal, Jose L.; and Walker, Wellington E., to Union Carbide Corporation. Catalyst for producing polyhydric alcohols and derivatives. 4,257,972, Cl. 260-429.00R.

Viennaplex Fabrik fur Kunststofferzeugnisse Ernst Pless KG: *See—*
Pless, Ernst, 4,257,616, Cl. 15-230.000.

Vilen, Erik O., to G. S. Blakeslee & Company. Drain plugs. 4,257,454, Cl. 137-593.000.

Villa, Alvaro J., to Walt Disney Productions. Optoelectronic amusement device. 4,257,612, Cl. 273-310.000.

Visual Graphics Corporation: *See—*
Kronman, Albert F.; and Hensy, Philip E., 4,257,696, Cl. 354-14.000.

Voccio, Joseph B.; and Voccio, Paul A. Earring construction. 4,257,241, Cl. 63-14.00D.

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Voith Getriebe KG: *See—*
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Volz, Robert G. Prosthetic knee joint tibial implant. 4,257,129, Cl. 3-1.911.

von Bockh, Peter, to BBC Brown Boveri & Company Limited. Feed water preheater. 4,257,360, Cl. 122-412.000.

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Berezin, Ilia V.; Goldmakher, Viktor S.; Klibanov, Alexandr M.; Martinek, Karel; Mishin, Alexandr A.; Samokhin, Gennady P.; Smirnov, Vladimir N.; Torchilin, Vladimir P.; and Chazov, Evgeny I., 4,257,269, Cl. 73-606.000.

Vydrin, Vladimir N.; Ageev, Leonid M.; and Pellenen, Anatoly P. Method and mill for rolling metal strip. 4,257,252, Cl. 72-232.000.

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Wada, Hideo; Ushio, Akiro; and Koganei, Masaharu, to Nippon Paint Co., Ltd. Non-aqueous composition for chemical treatment of a metallic substrate. 4,257,828, Cl. 148-6.160.

Wagner, Claus: *See—*
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Wakabayashi, Hiroharu: *See—*
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Wakeley, Harold: *See—*
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Wald, Stephen A., to Lydall, Inc. Filter. 4,257,791, Cl. 55-382.000.

Walker, Loren H.; and Cutler, John H., to General Electric Company. Inverter power conversion system having improved control scheme. 4,258,416, Cl. 363-137.000.

Walker, Wellington E.: *See—*
Vidal, Jose L.; and Walker, Wellington E., 4,257,972, Cl. 260-429.00R.

Wall, Lawrence S., to Texas Instruments Incorporated. Electrically alterable floating gate memory with self-aligned low-threshold series enhancement transistor. 4,258,378, Cl. 357-41.000.

Walser, Armin, to Hoffmann-La Roche Inc. Benzodiazepine intermediates for the preparation of imidazobenzodiazepines. 4,257,946, Cl. 260-239.0BD.
Walt Disney Productions: *See*—
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Walther, Carl K.; and Tolle, Hans, to Carl Kurt Walther GmbH & Co. Method of and apparatus for grinding workpieces by vibratory scouring. 4,257,196, Cl. 51-163.200.
Walz, Alfred; and Birk, Adalbert, to Siemens Aktiengesellschaft. Ultrasonic imaging apparatus. 4,257,270, Cl. 73-620.000.
Wang, Patricia C.; Wingard, Robert E., Jr.; and Bunes, Leonard A., to Dynapol. Process for preparing orange polymeric colorants. 4,258,189, Cl. 546-76.000.
Wangeby, Percy; and Pahlsson, Nils-Erik, to Kockums Industri AB. Device for feeding trees in tree delimbing machines. 4,257,461, Cl. 144-2.00Z.
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Tokuda, Kazuo; Watanabe, Hidetaro; and Shimizu, Yoshikazu, 4,258,311, Cl. 323-313.000.
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Watanabe, Kiyoto; and Otani, Syuichi, to Nissan Motor Company, Limited. Arrangement of plug-in type fuses on a mounting board. 4,258,350, Cl. 337-198.000.
Watanabe, Masashi, to Ebara Corporation. Boiler. 4,257,358, Cl. 122-235.00R.
Watanabe, Mitsugu; and Hirano, Tomoyuki, to Yazaki Corporation. Method of manufacturing noise reduction connectors. 4,258,076, Cl. 427-14.100.
Watanabe, Noritoshi; Nakamura, Masato; and Fujita, Seigoro, to Kanzaki Paper Manufacturing Co., Ltd. Method for the production of a matted transparent paper and the product thereof. 4,257,843, Cl. 162-146.000.
Watanabe, Tomoyuki; Okabe, Takahiro; Nagata, Minoru; Nakamura, Tohru; Kaneko, Kenji; Okada, Yutaka; Anzai, Norio; Nishimura, Takanori; and Agatsuma, Takashi, to Hitachi, Ltd. IIL With in and outdiffused emitter pocket. 4,258,379, Cl. 357-44.000.
Waters, John R. Toy glider. 4,257,187, Cl. 46-79.000.
Watson, Alan R., to Electro-Voice, Incorporated. Pressure gradient electret microphone. 4,258,235, Cl. 179-121.00D.
Watson, Thomas E., to Westinghouse Electric Corp. Impeller and shaft assembly for high speed gas compressor. 4,257,744, Cl. 416-244.00R.
Watson, W. Keith R. High efficiency solar collector. 4,257,398, Cl. 126-427.000.
Watts, John D.: *See*—
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Webasto-Werk W. Baier GmbH and Co.: *See*—
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Wegmann, Jerome B.; and Cook, Norbert F., to McNeil Corporation. Hand-held battery-powered grease gun. 4,257,540, Cl. 222-262.000.
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Humber, David C.; Laing, Stuart B.; and Weingarten, Gordon G., 4,258,183, Cl. 544-22.000.
Weis, Claus D.; and Sutter, Peter, to Ciba-Geigy Corporation. Process for producing 2,3,5-trichloropyridine. 4,258,194, Cl. 546-345.000.
Weisbach, Gunter, to VEB Polygraph Leipzig, Kombinat fur polygraphische Maschinen und Ausrustungen. Method and device for aligning sheets to be printed in a press. 4,257,586, Cl. 271-235.000.
Weischedel, Richard C., to General Electric Company. Switching regulator with flyback control offset. 4,258,308, Cl. 323-285.000.
Weisman, Irving H.; Strauss, Bernard; George, David; and Wakeley, Harold, to United States of America, Army. Optical indexing system. 4,258,388, Cl. 358-100.000.
Weisrock, William P.: *See*—
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Well Control, Inc.: *See*—
Toelke, Lester; and Kimmel, J. D., 4,257,245, Cl. 64-23.000.
Well Men Industrial Co. Limited: *See*—
Kwan, Wong K., 4,257,433, Cl. 132-11.00A.
Wells, Adoniram J., to Du Pont de Nemours, E. I., and Company. Dosimeter having a low air flow rate. 4,257,746, Cl. 417-43.000.
Welschof, Hans-Heinrich, to Lohr & Bromkamp GmbH. Telescopic drive shaft. 4,257,244, Cl. 64-23.000.
Wen, Gene Y., to Bendix Corporation, The. Single injector, single point fuel injection system. 4,257,376, Cl. 123-472.000.
Wentworth, Roland A. L. Mathematical apparatus. 4,257,175, Cl. 434-208.000.
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Wernicke, Hans J.; and Mikulla, Klaus D., to Linde Aktiengesellschaft. Use of vacuum residue in thermal cracking. 4,257,871, Cl. 208-57.000.
Werth, Dee A.: *See*—
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Westerberg, Sven P. J., to Atlas Copco Aktiebolag. Pressure fluid powered machine tool. 4,257,489, Cl. 173-159.000.
Westerman, William J., II, to Chamberlain Manufacturing Corporation. Evacuated solar receiver utilizing a heat pipe. 4,257,402, Cl. 126-443.000.
Western Electric: *See*—
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Western Electric Co., Inc.: *See*—
Rapp, Willard E., 4,257,901, Cl. 210-791.000.
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Brice, Larry D., 4,257,345, Cl. 118-634.000.
Brown, Joel E.; and Overman, Kelly C., 4,258,362, Cl. 343-7.300.
Calfo, Raymond M.; Mulach, Arthur; Fidei, Frank P.; and Minto, James G., 4,258,281, Cl. 310-256.000.
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Michael, Jacob F., 4,258,289, Cl. 315-60.000.
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Wheeler, Thomas N., to Union Carbide Corporation. Photochemical method for producing biocidal 2-aryl-1,3-cyclohexanedione compounds. 4,257,858, Cl. 204-158.00R.
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Moss, Alfred W., 4,257,147, Cl. 19-0.200.
White, Harold R.; and Doncer, Alexander J., Jr., to Alar Engineering Corporation. Method of clarifying liquids. 4,257,900, Cl. 210-776.000.
White, Jackie L., to R. J. Reynolds Tobacco Company. Process for expanding tobacco. 4,257,431, Cl. 131-140.00P.
Whitehouse, Martin H.; and Billows, Mitchell J., to Byrne & Davidson Doors (N.S.W.) Pty. Limited. Roller door operating mechanism. 4,257,285, Cl. 74-405.000.
Whitehurst, Darrell D.: *See*—
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Whitley, Oran D.; and Pogue, James B. Pressure differential circulating valve. 4,257,484, Cl. 166-325.000.
Whittaker Corporation: *See*—
Mansukhani, Ishwar R., 4,258,367, Cl. 346-1.100.
Whittaker, Graham; and O'Brien, Anne, to Imperial Chemical Industries Limited. Liquid phase preparation of 2-chloro-5-trifluoromethylpyridine and 2-chloro-5-perchlorofluoromethylpyridine. 4,257,857, Cl. 204-158.0HA.
Wieder, Solomon. Fluid flow controller. 4,257,395, Cl. 126-422.000.
Wierusz, Lech: *See*—
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Wiggins Teape Limited: *See*—
Green, Kieron P.; Inglis, Bruce R.; Allen, Roger A.; and Tringham, Roger W., 4,257,754, Cl. 425-84.000.
Wilczewski, Robert H.; and Blomquist, James E. Transport system for a dot matrix printing mechanism. 4,257,282, Cl. 74-125.000.
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William Carter Company, The: *See—*
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Williams, Earl. Bicycle lock bracket. 4,257,248, Cl. 70-236.000.

Williams, Frank J., III; and Dellacoletta, Brent A., to General Electric Company. Method for making bisphenoxide salts and bisimides derived therefrom. 4,257,953, Cl. 260-326.00R.

Williams, Gayland M. Apparatus and method for dispensing seeds from seed packages. 4,257,534, Cl. 222-1.000.

Williams, Hansel O.: *See—*
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Williams, Hazel E.: *See—*
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Williams, Robert C. Grate lock device. 4,257,193, Cl. 49-465.000.

Williams, Roger W. Magnetically actuated digital switch. 4,258,346, Cl. 335-206.000.

Williamson, David G.: *See—*
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Wilson, William L. Apparatus for flying toy airplane. 4,257,186, Cl. 46-77.000.

Windmoller & Holscher: *See—*
Feldkamper, Richard, 4,258,267, Cl. 250-560.000.
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Wingert, Louis E. Method for securing wires to screw terminals. 4,257,159, Cl. 29-861.000.

Winkleblack, Robert K., to Electric Power Research Institute. Heat exchanger and method. 4,257,480, Cl. 165-165.000.

Wirges, Winfried, to Stabilus GmbH. Support column of adjustable length. 4,257,582, Cl. 267-120.000.

Wirtz, Hans: *See—*
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Witte, Ernst-Christian; Wolff, Hans P.; Thiel, Max; Stegmeier, Karlheinz; and Roesch, Egon, to Boehringer Mannheim GmbH. Phenoxyalkylcarboxylic acid compounds and thrombocyte-aggregation inhibition. 4,258,058, Cl. 424-309.000.

Wixon, Harold E., to Colgate Palmolive Company. Laundry detergent in gel form. 4,257,908, Cl. 252-135.000.

Wober, Wolfram; Franzius, Dirk; Andersson, Gerd; Jung, Klaus; Suess, Peter; and Wagner, Claus, to Blohm & Voss AG. Oil skimming apparatus. 4,257,889, Cl. 210-104.000.

Wodka, Michael A.: *See—*
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Woodmansee, Donald E., to General Electric Company. Coal gasification process. 4,257,782, Cl. 48-200.000.

Woodrow, David G., to GSW Limited/GSW Limitee. Roll-formed metal eavestroughing with plastic fittings. 4,257,716, Cl. 405-118.000.

Woods, Robert L., to Eaglemotive Industries, Inc. Temperature responsive fan clutch for vehicle engine. 4,257,501, Cl. 192-58.00C.

Woods, Thomas S., to Du Pont de Nemours, E. I., and Company. Fungicidal haloalkyl polyhaloquinoxaline sulfonates. 4,258,044, Cl. 424-250.000.

Woronowicz, Eric M., to General Electric Company. Compton effect deemphasizer for gamma cameras. 4,258,428, Cl. 364-527.000.

Worrell, G. Richard, to Atlantic Richfield Company. Distillation of aqueous tertiary butyl hydroperoxide. 4,257,852, Cl. 203-99.000.

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Wright, Keith W. J.: *See—*
Scales, John T.; and Wright, Keith W. J., 4,257,128, Cl. 3-1.911.

Wright, Roy F., to Phillips Petroleum Company. Ternary polymer blends. 4,258,145, Cl. 525-99.000.

Wrightcel, Ltd.: *See—*
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Wuerzer, Bruno: *See—*
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Wurfel, Helmut: *See—*
Jorzyk, Sigurd; and Wurfel, Helmut, 4,257,870, Cl. 208-39.000.

Wygnanski, Israel; and Fiedler, Heinrich, to Remot University Authority for Applied Research & Industrial Develop. Ltd. Method and apparatus for controlling the mixing of two fluids. 4,257,224, Cl. 60-204.000.

Xerox Corporation: *See—*
Laing, Jean W.; and Hubble, Fred F., III, 4,258,258, Cl. 250-324.000.
Lentz, James A., 4,257,699, Cl. 355-3.0FU.
Smith, Wayne R., 4,257,587, Cl. 271-236.000.

Yabuta, Yorimiti: *See—*
Uchida, Toshio; Yabuta, Yorimiti; Tachikawa, Hiromichi; and Ikeda, Teppei, 4,258,122, Cl. 430-253.000.

Yaegashi, Takashi: *See—*
Fujii, Setsuro; Sugimoto, Mamoru; and Yaegashi, Takashi, 4,257,940, Cl. 260-112.50R.

Yagi, Hideji: *See—*
Ono, Masamichi; Eto, Akira; and Yagi, Hideji, 4,257,261, Cl. 73-134.000.

Yallup, Albert E.: *See—*
Dymond, Harry F. D.; and Yallup, Albert E., 4,257,777, Cl. 23-232.00E.

Yamada, Masayoshi: *See—*
Shimada, Katsuhiko; Komine, Isamu; Tanabe, Hideya; Tsunozaki, Shuichi; Yamada, Masayoshi; and Takahashi, Tsuguo, 4,258,319, Cl. 324-226.000.

Yamada, Minoru: *See—*
Matsumoto, Hiromitsu; and Yamada, Minoru, 4,257,374, Cl. 123-432.000.

Yamada, Takashi: *See—*
Sekiya, Fukuo; and Yamada, Takashi, 4,258,431, Cl. 368-188.000.

Yamada, Toyomichi: *See—*
Yamazaki, Yasuhiro; Wakahara, Yasushi; Yuuki, Kiyohiro; and Yamada, Toyomichi, 4,258,392, Cl. 358-260.000.

Yamada, Yorinobu: *See—*
Matsuura, Ryo; Sakai, Kazuaki; Sato, Tuneyasu; Yamada, Yorinobu; and Bandow, Kowzo, 4,257,851, Cl. 203-31.000.

Yamaguchi, Tatsuo: *See—*
Aoshima, Atsushi; Mitsui, Ryoichi; and Yamaguchi, Tatsuo, 4,258,217, Cl. 568-474.000.

Yamaha Hatsukoki Kabushiki Kaisha: *See—*
Matsumoto, Hiromitsu; and Yamada, Minoru, 4,257,374, Cl. 123-432.000.
Matsumoto, Hiromitsu, 4,257,384, Cl. 123-575.000.

Yamaka, Eizo: *See—*
Karube, Norio; Morita, Yasuyuki; Yamaka, Eizo; and Kuno, Takasi, 4,258,246, Cl. 219-121.0LW.

Yamamoto, Shinji: *See—*
Ogawa, Masaki; Araki, Tamio; and Yamamoto, Shinji, 4,257,468, Cl. 152-209.00R.

Yamamoto, Tadashi: *See—*
Nishimura, Nobuzi; Tsuji, Masayuki; Konishi, Seizo; Yamamoto, Tadashi; Tokieda, Takemi; Sawa, Utazi; and Koumura, Suketsugu, 4,257,770, Cl. 8-549.000.

Yamane, Mamoru: *See—*
Murakami, Tadashi; Yamane, Mamoru; Tokairin, Toshio; and Kawai, Kenji, 4,257,778, Cl. 44-1.00R.

Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Kawata, Hiroitsu; Ohmura, Tadayoshi; Shiozawa, Hiroyoshi; and Hattori, Munetaka, 4,258,179, Cl. 536-95.000.

Yamasaki, Masafumi, to Olympus Optical Co., Ltd. Control circuit for flash tube apparatus. 4,258,294, Cl. 315-151.000.

Yamauti, Juniti: *See—*
Takagahara, Isamu; Yamauti, Juniti; Yoshimura, Setsuko; Fujii, Katsumi; and Horio, Takekazu, 4,258,131, Cl. 435-26.000.

Yamazaki, Keiji; and Kobori, Toshio, to Minolta Camera Kabushiki Kaisha. Projecting member carried by the base plate for cameras. 4,257,697, Cl. 354-152.000.

Yamazaki, Masami: *See—*
Kitamura, Masatsugu; Onoye, Hideo; and Yamazaki, Masami, 4,258,397, Cl. 360-31.000.

Yamazaki, Yasuhiro; Wakahara, Yasushi; Yuuki, Kiyohiro; and Yamada, Toyomichi, to Kokusai Denshin Denwa Kabushiki Kaisha; and Nippon Telegraph and Telephone Public Corporation. Coding method for facsimile signal. 4,258,392, Cl. 358-260.000.

Yamazoe, Hisamitsu: *See—*
Kinugawa, Masumi; and Yamazoe, Hisamitsu, 4,257,377, Cl. 123-492.000.

Yancey, Don R. Pulse pattern visual acuity device. 4,257,689, Cl. 351-13.000.

Yang, Kuei-Hsiung: *See—*
Schwuttke, Guenter H.; and Yang, Kuei-Hsiung, 4,257,827, Cl. 148-1.500.

Yano, Kohzo: *See—*
Kuwagaki, Hiroshi; Hamada, Hiroshi; Takechi, Sadatoshi; and Yano, Kohzo, 4,257,683, Cl. 350-357.000.

Yano, Tsuneomi: *See—*
Yuzawa, Haruo; and Yano, Tsuneomi, 4,257,381, Cl. 123-571.000.

Yaoka, Osamu: *See—*
Nakao, Toru; Setoguchi, Shinro; and Yaoka, Osamu, 4,258,185, Cl. 544-114.000.

Yazaki Corporation: *See—*
Watanabe, Mitsugu; and Hirano, Tomoyuki, 4,258,076, Cl. 427-14.100.

Yee, Hugh. Process for measuring lecithin concentration in biological fluids. 4,257,771, Cl. 23-230.00B.

Yelland, Michael, to Imperial Chemical Industries Limited. 2-Nitro-4'-aminodiphenylamine-2',4-disulfonic acid and process for its preparation. 4,257,977, Cl. 260-510.000.

Yeo, Claude E. Plumbing snake-hose attachment. 4,257,139, Cl. 15-104.3SN.

Yin, Robert I.; and Lewis, Jerry G., to Merck & Co., Inc. Novel blend of algin, TKP, and guar gum. 4,257,816, Cl. 106-208.000.

Yin, Robert I.: *See—*
Racciato, Joseph S.; and Yin, Robert I., 4,257,768, Cl. 8-561.000.

Yokogawa Electric Works, Ltd.: *See—*
Kurita, Yoshio; and Shibata, Yukitake, 4,257,275, Cl. 73-861.060.

Yokomori, Shinji: *See—*
Tanaka, Akio; Nakajima, Yoshihisa; and Yokomori, Shinji, 4,257,435, Cl. 133-3.00R.

Yokota, Hideo; and Tamamura, Hideo, to Canon Kabushiki Kaisha. Distance measuring finder. 4,257,704, Cl. 356-8.000.

Yokota, Hideo: *See—*
Momiyama, Kikuo; and Yokota, Hideo, 4,257,678, Cl. 350-465.000.

Yomamoto, Yoshiyuki; Yoshioka, Akira; and Morikawa, Masanobu, to Toray Industries, Inc. Flame retarding polyester composition. 4,258,153, Cl. 525-397.000.

Yonkers, Edward H.; Stenfors, Alan; and Mathus, Gregory, to Data Packaging Corporation. Cassette storage rack. 4,257,524, Cl. 211-71.000.

Yoshida, Hiroshi; and Akashi, Shunji, to Yoshida Kogyo, K.K. Apparatus for joining opposed leg portions of molded coupling elements for slide fasteners. 4,257,839, Cl. 156-555.000.

Yoshida, Keizo; Fujii, Takashi; and Kikuchi, Hiroyuki, to Fujisawa Pharmaceutical Co., Ltd. Novel hyaluronidase BMP-8231 and production thereof. 4,258,134, Cl. 435-201.000.

Yoshida Kogyo, K.K.: *See—*
Yoshida, Hiroshi; and Akashi, Shunji, 4,257,839, Cl. 156-555.000.

Yoshida, Masahide; and Kodama, Takashi, to Olympus Optical Co., Ltd. Multi-channel record/playback magnetic head. 4,258,401, Cl. 360-125.000.

Yoshida, Masashi: *See—*
Iijima, Kazunori; Honma, Kazuo; Terayama, Takao; Yoshida, Masashi; Kawase, Hideyuki; and Miyakawa, Seii, 4,258,399, Cl. 360-85.000.

Yoshida, Tetsuo; Ogura, Toshiyuki; Tajiri, Shinji; and Sata, Toshio, to Fuji Photo Film Co., Ltd. Method of manufacturing paper containers. 4,257,317, Cl. 93-40.000.

Yoshikawa, Noriaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic cross-sectional imaging apparatus. 4,257,256, Cl. 73-626.000.

Yoshimoto, Hiromu; Okumura, Michitoshi; and Kawate, Kenji, to Daidotokushuko. Method for cooling an aluminum strip during the process of heat treatment. 4,257,829, Cl. 148-13.000.

Yoshimura, Setsuko: *See—*
Takagahara, Isamu; Yamauti, Juniti; Yoshimura, Setsuko; Fujii, Katsumi; and Horio, Takekazu, 4,258,131, Cl. 435-26.000.

Yoshioka, Akira: *See—*
Yomamoto, Yoshiyuki; Yoshioka, Akira; and Morikawa, Masanobu, 4,258,153, Cl. 525-397.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See—*
Nakao, Toru; Setoguchi, Shinro; and Yaoka, Osamu, 4,258,185, Cl. 544-114.000.

Yu, Ruey J.; and Van Scott, Eugene J. Treatment of psoriasis with nicotinamide analogues. 4,258,052, Cl. 424-266.000.

Yuasa Battery Company Limited: *See—*
Nakagawa, Yoshichika, 4,258,107, Cl. 429-78.000.

Yukuta, Toshio; Ishiwaka, Takumi; and Usui, Kiyoshi, to Bridgestone Tire Company Limited. Process for producing flame-resistant foam resins. 4,258,139, Cl. 521-110.000.

Yursis, Paul J.: *See—*
Conrey, Richard N.; McQuaid, Phillip T.; and Yursis, Paul J., 4,257,594, Cl. 273-29.00A.

Yuuki, Kiyohiro: *See—*
Yamazaki, Yasuhiro; Wakahara, Yasushi; Yuuki, Kiyohiro; and Yamada, Toyomichi, 4,258,392, Cl. 358-260.000.

Yuzawa, Haruo; and Yano, Tsuneomi, to Nissan Motor Company, Limited. Exhaust gas recirculation system controlled by a microcomputer for an internal combustion engine. 4,257,381, Cl. 123-571.000.

Zabel, Herbert E., to American Home Products Corporation. Pressure cooker. 4,257,394, Cl. 126-374.000.

Zafferri, Roberto; and Grosjean, Laurent, to Ebauches S.A. Electro-acoustic device for alarm watch. 4,258,432, Cl. 368-250.000.

Zann, Annie: *See—*
Beguin, Alain; Zann, Annie; and Dubois, Jean-Claude, 4,257,910, Cl. 252-299.000.

Zanzerl, Hermann, to Hatebur Umformmaschinen AG. Stamping apparatus with improved ejection mechanism. 4,257,253, Cl. 72-345.000.

Zaromb, Solomon. Apparatus and methods for the electrolytic production of aluminum metal. 4,257,855, Cl. 204-67.000.

Zeidler, Guenter: *See—*
Liertz, Heinrich; Oestreich, Ulrich; and Zeidler, Guenter, 4,257,707, Cl. 356-73.100.

Zelahy, John W.: *See—*
Betts, Robert K.; Grisik, John J.; and Zelahy, John W., 4,257,741, Cl. 416-190.000.

Zelenka, Alfred: *See—*
Herschtal, Ludwik; and Zelenka, Alfred, 4,258,433, Cl. 370-24.000.

Zeller, Hans, to Robert Bosch GmbH. Method and apparatus for controlling an internal combustion engine during and after engine braking. 4,257,363, Cl. 123-423.000.

Zepp, Charles M.: *See—*
Foley, James W.; Locatell, Louis, Jr.; and Zepp, Charles M., 4,258,118, Cl. 430-221.000.

Zeria-Shinyaku Kogyo Kabushiki Kaisha: *See—*
Sasaki, Koji; and Harada, Yasukazu, 4,258,030, Cl. 424-94.000.

Zeschmar, Winfried: *See—*
Hiller, Heinz; Schlauer, Johann; Doerges, Alexander; Kempf, Georg; Svoboda, Vaclav; and Zeschmar, Winfried, 4,258,019, Cl. 423-223.000.

Zhigarev, Ivan V.: *See—*
Kudryavtsev, Boris B.; Krasnokutsky, Valentin P.; Fedotov, Lev A.; Sholk, Semen F.; Svidler, Jury R.; Zhigarev, Ivan V.; Begunov, Nikolai N.; Kostylev, Valentin F.; Brodsky, Jury M.; and Knyazev, Vadim A., 4,257,888, Cl. 210-97.000.

Zielke, Clyde W.; and Bagshaw, Gary H., to Conoco, Inc.; and United States of America, Energy. Hydrocracking with molten zinc chloride catalyst containing 2-12% ferrous chloride. 4,257,873, Cl. 208-108.000.

Zielke, Clyde W.; and Rosenhoover, William A., to Conoco, Inc.; and United States of America, Energy. Method for the regeneration of spent molten zinc chloride. 4,257,914, Cl. 252-415.000.

Zieschang, Edwin C. Hay handling apparatus. 4,257,725, Cl. 414-84.000.

Zini, Roberto, to CIR S.p.A. Divisione ASAIB. Apparatus for feeding liquid adhesive. 4,257,562, Cl. 239-590.300.

Zink, John S.; Reed, Robert D.; Glomm, Horst M.; and Sawatski, Klaus E., to John Zink Company. Multi-fuel gas burner using preheated forced draft air. 4,257,762, Cl. 431-177.000.

Zipp, Otmar: *See—*
Jarre, Wolfgang; Mueller, Gerhard; Zipp, Otmar; and Ropte, Eckhard, 4,258,141, Cl. 521-114.000.

Zrinyi, Miklos: *See—*
Mariasi, Bela; Molnar, Laszlo; Toth, Janos; Gulya, Imre; Nagy, Miklos; Wolfram, Ervin; Zrinyi, Miklos; Kovacs, Gaborne; and Jaksity, Laszlone, 4,258,163, Cl. 526-202.000.

Zuhlke Engineering AG: *See—*
Buchmann, Hans, 4,257,291, Cl. 83-71.000.
Buchmann, Hans, 4,257,551, Cl. 234-38.000.

Zussman, Hyman W.; Knell, Martin; and Dexter, Martin, to Ciba-Geigy Corporation. Process for curing saturated polymers using divinyl hydantoin coagents. 4,258,149, Cl. 525-193.000.

Zverev, Anatoly I.: *See—*
Dudko, Daniil A.; Zverev, Anatoly I.; Astakhov, Evgeny A.; and Pulyaevsky, Georgy G., 4,258,091, Cl. 427-422.000.

Zytkovicz, Duane J.: *See—*
Dickhudt, Eugene A.; and Zytkovicz, Duane J., 4,257,429, Cl. 128-786.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF MARCH, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Borax Holdings Limited: *See*—
Harson, Samuel E.; and Fogg, Edward, Re. 30,553, Cl. 260-105.000.

Ferrari, Harry. Method of producing string of polyamide and stringed rackets with such string. Re. 30,555, Cl. 250-492.00R.

Fogg, Edward: *See*—
Harson, Samuel E.; and Fogg, Edward, Re. 30,553, Cl. 260-105.000.

Harson, Samuel E.; and Fogg, Edward, to Borax Holdings Limited. Metal organophosphorus compounds. Re. 30,553, Cl. 260-105.000.

Howard, Durrell U.: *See*—
Reise, Herman A., Re. 30,550, Cl. 188-112.00A.

Hurt, Frank K.; and Wellons, Edwin L., to Mefcor, Inc. Belt switch. Re. 30,551, Cl. 198-502.000.

Johnson, Gordon C.: *See*—
Weinberg, Kurt; and Johnson, Gordon C., Re. 30,554, Cl. 260-429.00R.

Kashiwabara, Hoichiro: *See*—
Teshima, Toru; Kashiwabara, Hoichiro; and Uchiyama, Yoshinori, Re. 30,556, Cl. 357-17.000.

Ludwig, George C., to Tom McGuane Industries, Inc. Fuel vapor vent valve. Re. 30,552, Cl. 236-101.00E.

Mefcor, Inc.: *See*—
Hurt, Frank K.; and Wellons, Edwin L., Re. 30,551, Cl. 198-502.000.

Mirtain, Henri J.; and Mishory, Jonathan, to Uniroyal, Inc.; and Uniroyal S.A. Pneumatic tire. Re. 30,549, Cl. 152-361.00R.

Mishory, Jonathan: *See*—
Mirtain, Henri J.; and Mishory, Jonathan, Re. 30,549, Cl. 152-361.00R.

Reise, Herman A., to Howard, Durrell U. Automatic trailer sway sensing and brake applying system. Re. 30,550, Cl. 188-112.00A.

Stanley Electric Co., Ltd.: *See*—
Teshima, Toru; Kashiwabara, Hoichiro; and Uchiyama, Yoshinori, Re. 30,556, Cl. 357-17.000.

Teshima, Toru; Kashiwabara, Hoichiro; and Uchiyama, Yoshinori, to Stanley Electric Co., Ltd. Indicating element and method of manufacturing same. Re. 30,556, Cl. 357-17.000.

Tom McGuane Industries, Inc.: *See*—
Ludwig, George C., Re. 30,552, Cl. 236-101.00E.

Uchiyama, Yoshinori: *See*—
Teshima, Toru; Kashiwabara, Hoichiro; and Uchiyama, Yoshinori, Re. 30,556, Cl. 357-17.000.

Union Carbide Corporation: *See*—
Weinberg, Kurt; and Johnson, Gordon C., Re. 30,554, Cl. 260-429.00R.

Uniroyal, Inc.: *See*—
Mirtain, Henri J.; and Mishory, Jonathan, Re. 30,549, Cl. 152-361.00R.

Uniroyal S.A.: *See*—
Mirtain, Henri J.; and Mishory, Jonathan, Re. 30,549, Cl. 152-361.00R.

Weinberg, Kurt; and Johnson, Gordon C., to Union Carbide Corporation. Coordination complexes as catalysts. Re. 30,554, Cl. 260-429.00R.

Wellons, Edwin L.: *See*—
Hurt, Frank K.; and Wellons, Edwin L., Re. 30,551, Cl. 198-502.000.

LIST OF DESIGN PATENTEES

Adams, Thomas S. Combined food holder and carving aid. 258,634, 3-24-81, Cl. D7-106.000.

Addison, Carl E.; and Comes, Rocky J. Irrigation spray nozzle. 258,678, 3-24-81, Cl. D23-35.000.

American Can Company: *See*—
Borzner, Andrew C., Jr.; and Howard, Fred, 258,629, Cl. D6-157.000.

Arrow AB: *See*—
Larsson, Nils, 258,677, Cl. D23-35.000.

Aulbert, Harold V., to Vaughan Furniture Company. Armoire or the like. 258,628, 3-24-81, Cl. D6-154.000.

Automatic Liquid Packaging, Inc.: *See*—
Pagels, Louis T., 258,689, Cl. D24-58.000.

Balleis, Peter K., to Lorenz Bolz GmbH & Co. Toy spinning top. 258,674, 3-24-81, Cl. D21-97.000.

Bartkowski, Walter B. Ring. 258,642, 3-24-81, Cl. D11-26.000.

Bates Industries, Inc.: *See*—
Beaubien, Thomas S.; Oehring, Robert E.; and Rich, Dennis C., 258,650, Cl. D12-158.000.

Beaubien, Thomas S.; Oehring, Robert E.; and Rich, Dennis C., to Bates Industries, Inc. Motorcycle tote box. 258,650, 3-24-81, Cl. D12-158.000.

Bell Telephone Laboratories, Incorporated: *See*—
Vaughan, David K.; and Walters, Rodney J., 258,656, Cl. D14-64.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Electronic typewriter. 258,663, 3-24-81, Cl. D18-1.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Desk top calculator. 258,664, 3-24-81, Cl. D18-7.000.

Berger, Christine J.: *See*—
Berger, Jeffrey D.; and Berger, Christine J., 258,660, Cl. D16-14.000.

Berger, Jeffrey D.; and Berger, Christine J. Walk-in multiple screen rear projection display unit. 258,660, 3-24-81, Cl. D16-14.000.

Boeing Company, The: *See*—
Booth, Murray A.; Webb, Everette L.; and Williams, Bill, 258,649, Cl. D12-80.000.
Brown, John F., Jr.; and Jackson, Boyce D., 258,647, Cl. D12-80.000.
Martin, Robert D.; Miller, Douglas S.; and Rice, Kenneth P., 258,648, Cl. D12-71.000.

Booth, Murray A.; Webb, Everette L.; and Williams, Bill, to Boeing Company, The. Airplane. 258,649, 3-24-81, Cl. D12-80.000.

Borzner, Andrew C., Jr.; and Howard, Fred, to American Can Company. Combined display and storage rack for clothing patterns or the like. 258,629, 3-24-81, Cl. D6-157.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Reichl, Ernst, 258,685, Cl. D23-148.000.

Boyko, Samuel, deceased; and by Boyko, Zenovia, executrix, to Boyko, Zenovia. Collapsible fire hydrant hose coupling tool, or wrench. 258,636, 3-24-81, Cl. D8-27.000.

Boyko, Zenovia: *See*—
Boyko, Samuel, deceased; and Boyko, Zenovia, executrix, 258,636, Cl. D8-27.000.

Boyko, Zenovia, executrix: *See*—
Boyko, Samuel, deceased; and Boyko, Zenovia, executrix, 258,636, Cl. D8-27.000.

Bretschger, Edward B., to Louis Marx & Co., Inc. Typewriter. 258,665, 3-24-81, Cl. D18-1.000.

Brown, John F., Jr.; and Jackson, Boyce D., to Boeing Company, The. Airplane. 258,647, 3-24-81, Cl. D12-80.000.

Burris Industries, Incorporated: *See*—
Halme, Matti, 258,627, Cl. D6-71.000.

Butcher, Geoff, to Hilary Page "Sensible" Toys Limited. Exploding toy rocket. 258,672, 3-24-81, Cl. D21-87.000.

Carbajales Santa Eulalia, Javier B.: *See*—
Carbajales Santa Eulalia, Jesus A.; and Carbajales Santa Eulalia, Javier B., 258,644, Cl. D11-158.000.

Carbajales Santa Eulalia, Jesus A.; and Carbajales Santa Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a scottish terrier. 258,644, 3-24-81, Cl. D11-158.000.

Christophel, John C. Wood stove. 258,684, 3-24-81, Cl. D23-97.000.

Colani, Luigi, to Friedrich Grohe Armaturenfabrik GmbH & Co. Faucet. 258,676, 3-24-81, Cl. D23-25.000.

Comes, Rocky J.: *See*—
Addison, Carl E.; and Comes, Rocky J., 258,678, Cl. D23-35.000.

Commisso, Nicholas D., to Mobil Oil Corporation. Compartmented food tray or the like. 258,632, 3-24-81, Cl. D7-38.000.

Copco, Inc.: *See*—
Lax, Michael, 258,631, Cl. D7-3.000.

deHaseth, John, to Jonee, Inc. Makeup center. 258,694, 3-24-81, Cl. D28-68.000.

Dembicks, Andrew E.; and Schurman, Peter T., to Plastic Forming Company, Inc., The. Chain saw case or the like. 258,626, 3-24-81, Cl. D3-30.000.

Dembicks, Andrew E.; and Schurman, Peter T., to Plastic Forming Company, Inc., The. Welding equipment carrier or the like. 258,645, 3-24-81, Cl. D12-32.000.

Dubbs, Bernard: *See—*
Unger, Philip; and Dubbs, Bernard, 258,651, Cl. D13-12.000.

Ed Sisty Angling Adventures, Inc.: *See—*
Sisty, Edwin J., deceased; and Sisty, Yoshie, executrix, 258,675, Cl. D22-23.000.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See—*
Colani, Luigi, 258,676, Cl. D23-25.000.

Geisheimer, James A. Ice bucket or similar article. 258,633, 3-24-81, Cl. D7-78.000.

Goldman, Paul R. Shoe heel. 258,620, 3-24-81, Cl. D2-323.000.

Goldman, Paul R. Shoe heel. 258,621, 3-24-81, Cl. D2-323.000.

Grunstad, Jerome A., to Ketcham & McDougall, Incorporated. Wall mountable index finder. 258,670, 3-24-81, Cl. D19-76.000.

Guillon, Claude, to Thomson-Brandt. Record turntable. 258,652, 3-24-81, Cl. D14-25.000.

Halme, Matti, to Burris Industries, Incorporated. Seat or similar article. 258,627, 3-24-81, Cl. D6-71.000.

Hefling, Jack D. Combined rain and wind gauge. 258,640, 3-24-81, Cl. D10-53.000.

Hilary Page "Sensible" Toys Limited: *See—*
Butcher, Geoff, 258,672, Cl. D21-87.000.

Hill, James B. Combined liquid dispensing container and cabinet. 258,658, 3-24-81, Cl. D15-112.000.

Hodge, Joseph. Aspirator tube. 258,688, 3-24-81, Cl. D24-54.000.

Howard, Fred: *See—*
Borzner, Andrew C., Jr.; and Howard, Fred, 258,629, Cl. D6-157.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Bellini, Mario, 258,663, Cl. D18-1.000.
Bellini, Mario, 258,664, Cl. D18-7.000.

Jackson, Boyce D.: *See—*
Brown, John F., Jr.; and Jackson, Boyce D., 258,647, Cl. D12-80.000.

John J. Madison Company, Inc.: *See—*
Carbajales Santa Eulalia, Jesus A.; and Carbajales Santa Eulalia, Javier B., 258,644, Cl. D11-158.000.

Johnson, Doris J. Child toilet training center. 258,679, 3-24-81, Cl. D23-53.000.

Johnson, Kenneth O. Combined air filter and freshener. 258,686, 3-24-81, Cl. D23-149.000.

Jonee, Inc.: *See—*
deHaseth, John, 258,694, Cl. D28-68.000.

Katsube, Akinaga. Therapeutic percussion device for relieving stiff shoulders. 258,687, 3-24-81, Cl. D24-36.000.

Ketcham & McDougall, Incorporated: *See—*
Grunstad, Jerome A., 258,670, Cl. D19-76.000.

Larsson, Gosta I.: *See—*
Nystrom, Kjell S.; and Larsson, Gosta I., 258,659, Cl. D15-139.000.

Larsson, Nils, to Arrow AB. Hand shower. 258,677, 3-24-81, Cl. D23-35.000.

Lax, Michael, to Copco, Inc. Combined covered casserole and serving cradle. 258,631, 3-24-81, Cl. D7-3.000.

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NOTE.—First number, class; second number, subclass; third number, patent number

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	351	258,622		131	258,635		80	258,647		45	258,661		87	258,672
	353	258,623	D8—	27	258,636			258,649		65	258,662		97	258,674
		258,624		98	258,637		158	258,650	D18—	1	258,663	D22—	23	258,675
	365	258,625		394	258,638	D13—	12	258,651			258,665	D23—	25	258,676
D3—	30	258,626	D9—	355	258,639	D14—	25	258,652		7	258,664		35	258,677
D6—	71	258,627	D10—	53	258,640			258,653			258,666			258,678
	154	258,628		59	258,641		43	258,654	D19—	34	258,667		53	258,679
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	191	258,630		141	258,643		64	258,656		76	258,669		67	258,681
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	38	258,632	D12—	32	258,645		112	258,658						

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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